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EXHIBITS 4 - 7

VOLUME II

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DEAD CREEK PROJECT SITES

AT CAHORIA/SAUGET, ILLINOIS

FINAL REPORT

VOLUME 2 OF 2

May 1988

Prepared for:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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APPENDIX A

DESCRIPTION OF CURRENT SITUATION AT THE DEAD CREEK PROJECT SITES

DESCRIPTION OF CURRENT SITUATION AT THE DEAD CREEK PROJECT SITES

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I. INTRODUCTION

The RI portion of the Dead Creek Project Remedial Investigation/Feasibility Study, as described in the Project Work Plan, includes eleven tasks to be completed. Task 5, Description of Current Situation, calls for Ecology and Environment, Inc. to prepare a description of the background information pertinent to the area and its problems and outline the purpose and need for remedial investigation in the area.

This report was prepared to provide the information on and a description of the current situation of the sites in the Dead Creek Project area. The report is organized to provide an area wide description followed by a detailed site by site description. The site by site description provides a detailed presentation of all available information concerning each site, which was acquired and evaluated during Tasks 3 and 4 of the RI.

II. GENERAL DESCRIPTION OF PROJECT AREA

Location

The Dead Creek Project area is located in and around the cities of Sauget (formerly Monsanto) and Cahokia in St. Clair County, Illinois (Figure 1). Under the scope of the RFP issued by the IEPA, the study area consists of 18 suspected uncontrolled hazardous waste sites located throughout the study area (Figure 2). The project area consists of 12 individual sites and 6 additional sectors in Dead Creek.

Areal Description and Topography

The sites to be investigated as part of the Dead Creek Project are in an area which contains a mixture of industrial, residential, commercial, farm, and undeveloped land. The sites consist of closed and active landfills, industrial property, undeveloped or currently unutilized land, residential land, and an areal drainage flowpath (Dead Creek).



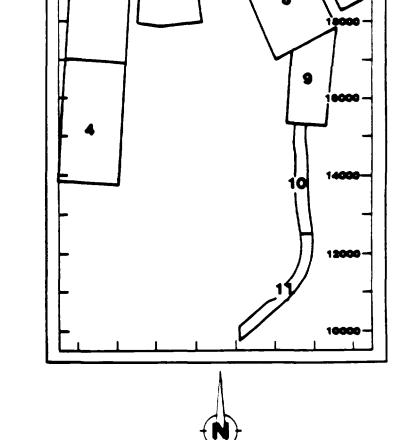
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underlain by basement granitic crystalline rock. The geologic formation sequence for South-Central Illinois is represented in Figure 4. The study area, the American Bottoms, and the Mississippi River channels are all located in a broad deep cut bedrock valley. The bedrock valley is delineated by bluff lines on both sides. Based upon available data, the bedrock valley has steep walls along the bluff lines while the valley bottom slopes gently toward the middle.

Within the bedrock valley, the Mississippi River has provided the primary mechanisms controlling the recent formation of geology and Bergstrom, et al (1956) suggests that the bedrock hydrogeology. valley is pre-glacial in nature; however, Willman et al (1970) concludes that insufficient data exists to suggest a pre-glacial valley structure for the Mississippi River. Nevertheless, glaciation: did significantly modify and redesign the Mississippi River and its valley through both glacial and interglacial periods. These changes occurred as glacial wasting caused massive amounts of meltwater to be directed generally southward through and around bedrock and ice contacts, ultimately discharging into the Gulf of Mexico. Through geologic history, a wide and deep valley (2 to 8 miles across and up to 170 feet deep) has been carved into the predominantly soft sedimentary bedrock underlying the river (Bergstrom, 1956). Changes in stream flow, direction, and sediment load have caused this valley to fill with secondary alluvial sediments. These constantly changing parameters have resulted in the river continuously picking up and depositing (and cutting and filling) its sediment base, thereby directing and redirecting the river and its channels throughout time.

The unconsolidated valley fill, present in the bedrock valley, ranges in thickness from approximately 70 to 120 feet in the study area. The thickness of the valley fill in the region of the study area is depicted in Figure 5. A cross section of the valley fill in the vicinity of the study area is presented in Figure 6.

The valley fill deposits are typically comprised of two main formations which may reach as deep as 120 feet in the site area. The Cahokia, the uppermost formation, is comprised of predominantly silt.

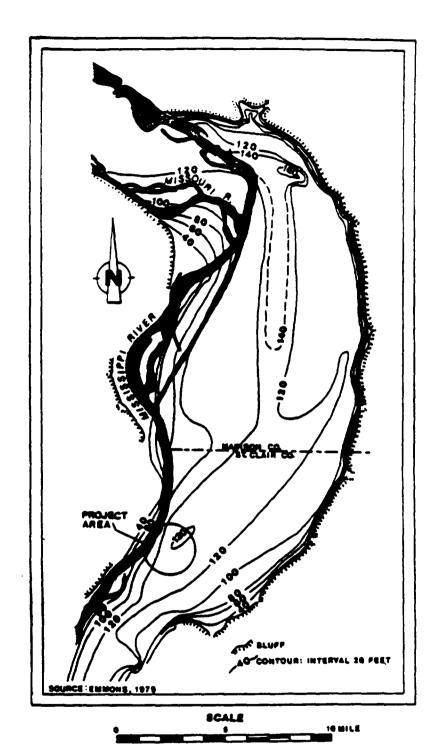


FIGURE 5
THICKNESS OF THE UNCONSOLIDATED VALLEY FILL IN THE
DEAD CREEK STUDY AREA

clay, and fine sand deposits generally indicative of an aggrading environment. These deposits were laid down as flood events of the Mississippi River, eolian activity, bank slumping, erosion, and/or slugs of material deposited directly by tributary streams. This formation has been frequently reworked by the Mississippi River and typically consists of coarser material intertongued with finer grained deposits. As such, these deposits can be variable in thickness (ranging from 15 to 30 feet). Larger expressions of tributary deposits may form thicker alluvial fans where high energy streams dissipated and dropped their sediment load.

The second major formation of the floodplain setting is the Mackinaw Member of the Henry Formation. This formation underlies the Cahokia Alluvium, and is comprised of sand and gravel from glacial outwash. Within the study area, this material rests directly on the bedrock surface and can be highly variable in thickness (70 to 100 feet) due to the fluvial processes which formed it. This formation typically contains portions which are complexly interbedded due to meandering of the river throughout history.

A third minor formation noted locally within the floodplain, but not discovered within the site investigation area, is the Peyton Colluvium. This material is comprised of fine grained silt (loess) and clay (till) which has slumped from upland areas and accumulated at the base of steep bluffs.

Immediately adjacent to the floodplain (and 3.5 to 5 miles east-south east of the sites) is an upland area marked by a steep (50 to 150 feet above surrounding terrain) bluff. Structurally, these upland areas are based unconformably on bedrock (which has not been eroded as deeply as the adjacent valley), and consists of 10 to 100 feet of uncolsolidated sediments of predominantly glacial origin. No upland formations exist in the study area; however, erosion and slumping of the upland has provided the parent material for the Cahokia Formation and Peyton Colluvium, which are found in the floodplain.

valley erosional processes to the southwest of the study area, while maintaining these same formations at a deeper elevation to the northeast of the study area.

Hydrology

The description of the hydrology of the study area is divided into the surface drainage and groundwater discussions presented below.

Surface Drainage

The Mississippi River extends far to the north and south of the site area and drains the American Bottoms and the tributary upland. Although the Mississippi River floodplain is subject to periodic inundation by excess water runoff, most of the area is protected from massive regional flooding by a complex series of levees and other flood control structures. This condition partially adds to local small scale flooding problems since precipitation is trapped behind the flood control structures where drainage is typically poor. Dead Creek itself provides drainage for a portion of the American Bottoms, and ultimately discharges to the Mississippi River via the Prairie DuPont Floodway and Cahokia Chute. Fenneman (1909) has suggested that Dead Creek may at one time have been a southward extension of Cahokia Creek. Excessive siltation, realignment of surface drainage, or stream piracy may have redirected Cahokia Creek to its present channel, thus cutting off Dead Creek from the original source water.

Major surface drainage in the area is also provided by Cahokia Creek (to the north) and the Old Prairie DuPont Creek (to the south). Both of these creeks channel surface water directly into the Mississippi River. Significant additional secondary drainage within the site area and floodplain is provided by an extensive system of storm drains, pumping stations, and ditches, which were constructed or modified from existing natural drainage features for this purpose.

depressed below ground surface except where affected by surface structure or well pumpage. Groundwater levels are affected by flood stages of the Mississippi River, and undergo water-level fluctuations as a result of seasonal weather patterns. In areas remote from major pumping centers, water levels generally recede in late spring, summer and early fall, when discharge from the groundwater reservoir by evapotranspiration, groundwater run-off to streams, and pumping from wells is greater than recharge. Recovery of water levels generally occurs in the early winter when conditions are favorable for infiltration of rainfall to the water table. Water level recovery is especially pronounced during the spring when the groundwater reservoir receives most of its annual recharge. Water levels are generally highest in May and lowest in December. Water levels remote from major pumping centers have a seasonal fluctuation ranging from 1 to 13 feet, with an average fluctuation of about 4 feet.

Based upon the surface drainage system for the region in 1900, R.J. Schicht (Illinois State Water Survey, 1965) estimated the piezometric surface prior to heavy development in the area. Groundwater elevation was estimated to be about 420 feet near the bluffs to about 400 feet near the Mississippi River. The piezometric surface had an average slope of about 3 feet per mile and ranged from 6 feet per mile in the Alton area to the north, to one foot per mile in the Dupo area to the south. The slope of the piezometric surface was greatest near the bluffs and flatest near the Mississippi River. Groundwater movement was generally directed to the west and south toward the Mississippi River and other streams and lakes.

Groundwater movement in the shallow deposits throughout the study area generally follow the land surface topography, with lateral movement toward local discharge zones (wells and small streams), and some movement into the deeper unconsolidated aquifers. Groundwater in the deeper unconsolidated deposits generally follows the bedrock surface. Accordingly, groundwater generally flows downstream through the sand and gravel aquifers in much the same direction as the original streamflow, but at a much slower rate.

recharge of the water table only captures a portion of the annual precipitation. A major portion of the precipitation runs-off to streams or is lost by the evapotransporation process before it reaches the aquifer. Nevertheless, precipitation is probably the most important recharge source for the study area as a whole. amount of surface recharge that reaches the saturation zone depends upon many factors, including the character of the soil and other materials above the water table, the topography, vegetal cover, 'and use, soil moisture, depth to the water table, the intensity and seasonal distribution of precipitation, and temperature. Because of the low relief and limited runoff in the study area, and because the upper silt and clay fill is not so impermeable as to prevent appreciable recharge, most of the precipitation either evaporates or seeps into the soil. Because of the extensive flood-control network in the area, recharge from floodwaters provides a limited input to Based upon a modified form of the Darcy equation, R.J. Schicht (1965) calculated the average rate of surface recharge to be about 371,000 gpd/sq. mi. for the study area.

Regional groundwater flow components to the west and south provide subsurface recharge to the study area. Schicht similarly estimated that the average recharge from subsurface flow of water from the eastern bluff boundary is 329,000 gpd/m1.

The lowering of the water table as a result of groundwater withdrawals in the study area has, in the past, established a hydraulic gradient from the Mississippi River toward the pumping centers. This resulted in water percolation through the river bed and into the aquifer, producing induced infiltration recharge. Schicht estimated the 1961 induced infiltration recharge volume for the study area to be approximately 18.5 million gpd, or roughly 58%, of the 31.9 million gpd total being withdrawn. Water withdrawal data from 1980 for the study area and areas to the north indicate that total withdrawals amount to only 3.9 million gpd as compared to more than 42 million gpd in 1961. Accordingly, for the study area, the amount of current induced infiltration from the Mississippi is

III. SITE SPECIFIC DESCRIPTIONS

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SITE G. ABANDONED LANDFILL

Site Description

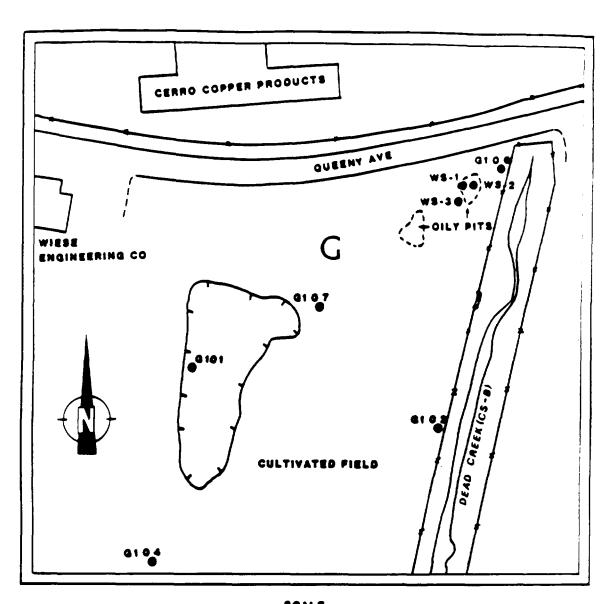
Site G is a former subsurface/surface disposal area which occupies approximately 4.5 acres in Sauget, Illinois. The site is bordered on the north by Queeny Avenue; on the east by Dead Creek; on the south by a cultivated field; and on the west by Wiese Engineering Company property.

The surface of Site G is littered with demolition debris and metal wastes. Several small pits have been observed in the northeast and east-central portions of the site. Oily and tar-like wastes, along with scattered corroded drums, are found in these areas. Additionally, 20-30 deteriorated drums are scattered along a ridge running east-west, near the southern perimeter of the site. The western portion of Site G is marked by a mounded area with several corroded drums protruding at the surface. A large depression is found immediately south of the mounded area. This depression receives surface runoff from a sizable area within the site. Also, exposed debris is present over most of the site. In areas where wastes are not exposed, flyash and cinder material has been used as cover.

Site History and Previous Investigations

Examination of historical aerial photographs indicates excavation at Site 6 began sometime prior to 1950 and disposal operations were initiated shortly thereafter. No information is available concerning owners or operators for Site 6 at the time disposal was occurring. The photographs suggest disposal activities at the site continued until the early 1970s. Presently, Site 6 is inactive, although recent observations suggest that random dumping of various non-chamical wastes continues.

Site G was previously studied by the Illinois EPA in 1980 and 1981 as



LEGENO
G186 IEPA MONITORING WELL
WS-1 IEPA WASTE SAMPLING LOCATION

FIGURE G-1 DEAD CREEK SITE AREA G WITH SAMPLE LOCATIONS

at Site G from a pit in the northeast corner. Analyses of these samples are presented in Table G-2. Elevated levels of heavy metals were found in all samples, as were various organic contaminants. PCBs were detected in sample WS-3, but not in the other two samples. Sample WS-1 showed the highest degree of organic contamination. Organics detected in this sample include dimethyl phenanthrene, phenyl indene, pyrene, trimethyl phenanthrene, and aliphatic hydrocarbons.

Data from additional samples taken adjacent to Site G in Dead Creek are addressed in the narrative for Creek Sector B. Site G may be a source of contamination in Dead Creek; however, since the hydrology in the area is not well-defined, this cannot presently be determined.

A geophysical investigation, including flux-gate magnetometry and electromagnetics (EM), was completed at Site G in December, 1985 as part of the Dead Creek RI/FS project. A survey grid with dimensions of 440 by 600 feet was laid out using a compass and tape measure. Because of the large amount of scrap metal scattered about the surface of Site G, instruments were calibrated in off-site areas. The magnetometer survey was subcontracted to Technos, Inc. of Miami, Florida.

The magnetometer survey at Site 6 showed that a major magnetic anomaly covers most of the northern portion of the site. Several smaller anomalies were found to the north of the large depression in the southwest corner of Site 6. Survey lines run south of the fill area in a cultivated field showed no magnetic anomalies above background conditions. The mounds in the northwest corner of the site showed smaller anomalies at the surface and larger anomalies for deeper readings, indicating significant quantities of buried metals.

An EM survey was done using the same grid as for the magnetometer investigation. Shallow soundings indicated three areas showing relatively high intensity anomalies. These include a 50 feet by 20

feet area in the northeast corner, a 150 feet by 100 feet area in the east-central portion, and the entire mounded area along the west perimeter of the site. Deep soundings (approximately 10 to 15 meters in depth) indicated a significant anomaly covers most of the northern portion of the site. Three negative anomalies were recorded in the center of the fill area, possibly indicating higher, off-scale instrument readings or the presence of significant quantities non-conductive material such as concrete. The EM survey also snowed anomalies trending off-site in the northwest corner, indicating the possibility that the actual filled area extends north under Queeny Avenue.

Data Assessment and Recommendations

Activities proposed at Site G for the Dead Creek Project include collecting 10 subsurface and 40 surface soil samples, and water samples from IEPA wells located on or near the site. A soil gas monitoring survey is also scheduled for Site G, and will be conducted in conjunction with ambient air monitoring at the site. Additional investigation is necessary to adequately characterize the site and to provide an adequate data base for conducting the feasibility study. Existing monitoring wells in the vicinity of the site need to be refurbished prior to sampling. Additional wells need to be installed around the site to determine if Site G is contributing to groundwater pollution in the area. Additional borings and subsurface sampling (alternatively excavation of test pits and sampling) in anomalous areas encountered during the geophysical study would be needed to provide additional information concerning depth of fill, waste characteristics, and past operation. This additional information will allow more specific evaluation of remedial alternatives. hydrology of Site G in relation to Dead Creek also needs to be assessed to determine if the site is a source of pollution observed in the creek. This assessment would include collecting the following data: (1) Ground water elevations from a minimum of three locations on each side of the creek. (2) Surface water and creek bed elevations from three locations in the creek, and (3) Infiltration rates for the

SITE H. ROGER'S CARTAGE PROPERTY

Site Description

Site H is a former disposal area covering approximately five acres in Sauget, Illinois. The site is located immediately southwest of the intersection of Queeny Avenue and Falling Springs Road. Presently, Site H is an open field which has been covered, vegetated, and graded. Several depression areas, capable of retaining rain water, are also evident. Surface drainage is generally to the west; although certain localized drainage is toward the aforementioned depressions.

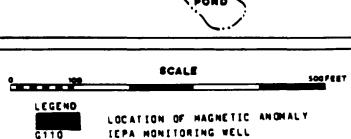
Site History and Previous Investigations

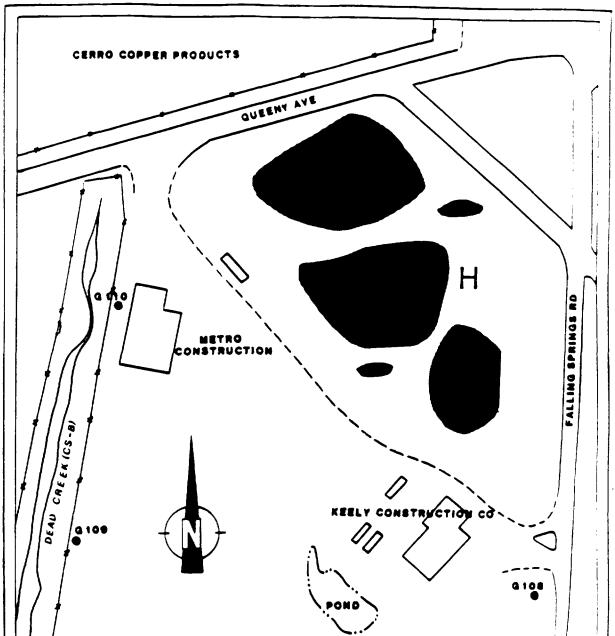
A review of historical aerial photographs indicates that Site H was initially used as a disposal area sometime around 1940. Monsanto Company submitted a "Notification of Hazardous Waste Site Form" to the U.S. EPA in 1981, indicating below-ground drum disposal of organics, inorganics, and solvents. The notification listed the site name as Sauget Monsanto Illinois Landfill, and indicated that waste disposal continued until 1957. Site H is presently owned by James Tolbird of Roger's Cartage Company. Photographs suggest the site initially operated as a sand and gravel borrow pit prior to disposal activities. The southern half of Site I operated contiguously with Site H, and the properties were subsequently separated by the construction of Queeny Avenue.

Previous investigation of Site H is limited to review of historical photographs and the installation of one monitoring well downgradient from the site. This well, Gl10, was sampled in 1980 and 1981 as part of IEPAs hydrogeological investigation. Analytical data for well Gl10 is shown in Tables 8-6, 8-7, and 8-8, presented in the Creek Sector B portion of this report. Contaminants detected in Gl10 include PCBs, chlorophenol, cyclohexanone, arsenic, copper, and nickel.

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FIGURE H-1 DEAD CREEK SITE AREA H WITH MAGNETIC ANOMALIES





Site Description

Site I is an operating copper refining and tube manufacturing facility covering approximately 55 acres in Sauget, Illinois. The areas of interest for the Dead Creek Project at this facility include a former sand and gravel pit which was subsequently filled with unknown wastes, and a holding pond (Creek Sector A) which formerly served as head waters for Dead Creek. The Cerro Copper Products property is bordered on the north by the Alton and Southern Railroad; on the west by Illinois Route 3; on the south by Queeny Avenue; and on the east by Falling Springs Road. The areas to be investigated encompass roughly the eastern one-third of the property. Presently, the former gravel pit/fill area is covered and graded, and is used for equipment storage.

Site History and Previous Investigations

Cerro DePasco Corporation of New York purchased the existing plant and property west of Dead Creek in 1957 from the Lewin-Mathes Corporation. Cerro Copper subsequently added property east of the creek to their holdings in 1967. Examination of historical aerial photographs indicate subsurface disposal at Site I was discontinued sometime between the years 1955-1962. These photographs also show that Site I and Site H, which is located across Queeny Avenue to the south, constitute one large subsurface disposal area. Monsanto company submitted a "Notification of Hazardous Waste Site" form for this landfill (Sauget Monsanto Illinois Landfill), indicating disposal of organics, inorganics, and solvents in drums. The years of operation listed on the notification are "unknown to 1957." Historical photographs suggest activity at the site began prior to 1937.

Creek Sector A reportedly received discharges from Monsanto and other companies prior to 1970. In the early 1970's, the culvert

TABLE IA-1: ANALYSIS OF WATER SAMPLES FROM CREEK SECTOR A (COLLECTED BY IEPA)

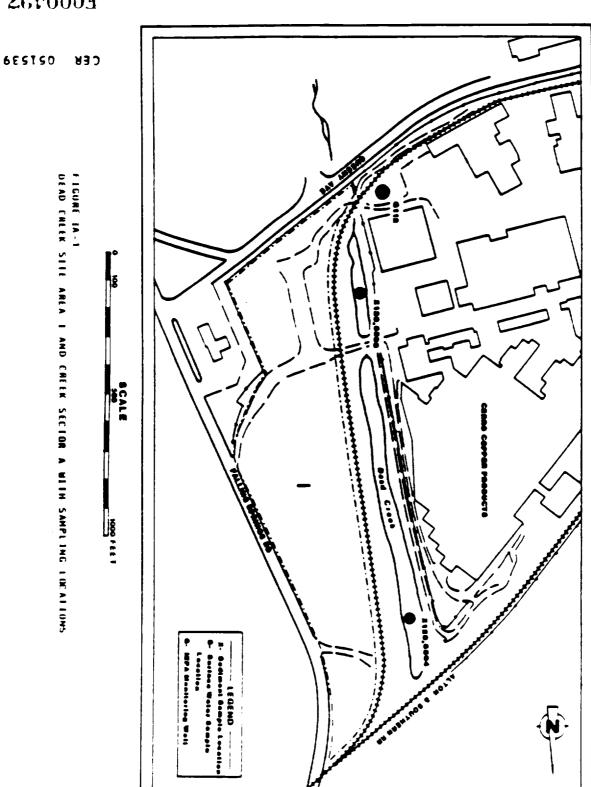
SAMPLE DATE AND LOCATION

	SAMPLE DATE AND LOCATION			
PARAMETERS	11/26/80 5503 5504		1/26/81 5501 5502	
Alkalinity	127	110		
Ammonia	0.2	1.0		
Arsenic	0.058	0.025		
Barium	1.2	0.7		
800-5	630	158		
Boron	0.2	0.3		
Cadmium	0.36	0.19		
COD		1190		
Chloride	33	36		
Chromium (Total)	0.61	0.21		
Copper	4.5	3.6		
Cyanide	.01	.01		
Fluoride	0.4	0.7		
Hardness	227	260		
Iron	58	28		
Lead	6.6_	2.8		
Magnesium	35.8	28.7		
Manganese	1.0	0.67		
Mercury	0.0016	0.0016		
Nickel	4.2	3.3		
Nitrate-Nitrite	1.4	1.7		
pH	6.9	7.0		
Phenols	0.02	0.035		
Phosphorus	1.9	3.4	·	
Potassium	4.3	6.2		
R.O.E.	361	407		
Selenium	0.002	0.14		
Silver	0.24	0.14		
Sodium	19.7	22.4		
Sulfate	90	130 17		
Zinc	30 22	28	2.0	_
PC8 (ppb)		40	2.0	-
Aliphatic hydrocarbons (ppb)	23,000			

NOTES: All results in ppm unless otherwise noted
Blanks indicate that parameter was not analyzed
- Indicates below detection limits

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Site Description

Site J consists of two pits and a surface disposal area utilized by an active steel foundry in the Village of Sauget, Illinois. The site is bordered on the north by the Alton and Southern Railroad; on the west by Monsanto Road; on the south by Little Avenue, and on the east by a Mobil Oil Tank Farm. The surface disposal area is defined by a triangular portion of the property to the northeast of the plant buildings. Generally, surface drainage in this area is directed toward a ditch along the northern perimeter. However, several scattered depression areas are also evident. Two unlined pits and one concrete-lined surface impoundment were observed at Site J, along with an incinerator which is no longer in use (Figure J-1).

Site History and Previous Investigations

The pit located southeast of the plant building was excavated approximately 30 years ago, based on a review of historical aerial photographs. According to the site operator, it was a borrow pit for road construction fill. The pit was subsequently filled with scrap metal, demolition debris, and casting sand. No evidence has been found suggesting disposal of hazardous materials in the borrow pit. The other-unlined pit, located north of the plant building, was excavated in approximately 1950 for the purpose of collecting and settling baghouse dust from furnaces in the foundry. The dust is blown into this pit through underground piping, thus reducing the chance for off-site migration of airborne particulates. The adjacent concrete impoundment has two aerators, used to cool water from the furnaces and compressors.

A small incinerator is situated immediately west of the former borrow pit at Site J (Figure J-1). It has a stack approximately 15-18 feet in height, and was used solely to burn trash and empty bentonite sacks, according to the plant operator. The incinerator was operated

for 10-12 years following its installation in 1970.

The surface disposal area covers approximately six acres to the northeast of the plant buildings. Sometime in the mid-1970's, Sterling Steel began to use this area for disposal of spent casting sand, slag, scrap steel, and construction debris. No initial excavation was done in this area prior to disposal activities, other than installing a drainage ditch along the northern perimeter. The area is periodically graded, although several depressional areas are evident. Several corroded drums, apparently containing only casting sand and slag, were also observed during a recent visit to the site.

R. O. Shive and Claude Harrell began operations at Sterling Steel Castings Company at its present location in 1922. In 1982, St. Louis Steel Company purchased the facility, and the name was changed to Sterling Steel Foundry, Inc. Raw materials used in Sterling's casting operations included manganese, chromium, nickel, the molybdenum, silicon, bentonite, and water. Water is circulated from furnaces and compressors to the aerated holding pond, and wastewater is directed to the Sauget Treatment Plant.

Site J has not been previously investigated by IEPA. The site was identified by inspection of historical photographs, which indicate possible disposal in the sand pits.

The original scope of work for the Dead Creek Project, as stipulated in the RFP, called for geophysical investigations at Site J to determine potential areas of drum disposal. Based on background review and visual observation, it was determined that geophysical surveys could not adequately define such locations in the originally proposed surface disposal area. This is due to the high metal content of the wastes in the area (casting sand, slag, scrap steel, steel shot), which would result in the entire site appearing as one large anomaly, thereby making it impossible to differentiate drums from other wastes.

Site Description

Site K is the location of a former sand pit for which no file information could be located. The site is located north of a residential area on Queeny Avenue, and east of Falling Springs Road in Sauget, Illinois (Figure K-1). Site K covers approximately six acres, and presently the property is unoccupied. Several trucks with the name M-T-S, Inc. (Sauget) on the doors were observed at the site during preliminary reconnaissance, but there was no activity at the property. Subsequent attempts to contact M-T-S, Inc. by telephone did not succeed. Several trailer homes and houses are located within 100 feet of the site. The pit, which constitutes Site K, has been filled and covered with soil and gravel, and the area has been graded to the surrounding topography.

Site History and Previous Investigation

Historical aerial photographs suggest possible waste disposal operations at Site K. Excavation at the site began sometime in the late 1940s. By 1955, the site was filled with unknown materials, and a vegetation cover had started to develop. No buildings were apparent at the site at the time of the initial excavation. After the excavation was filled, the site remained unchanged until at least 1968. Photographs from 1973 again show an excavation, somewhat larger than the first one, in the same location at Site K. This pit contained water, as seen in photographs from 1973 and 1974, and a building had been erected at the site sometime prior to 1973. No information has been located concerning operations at the site during this time period. The second excavation was filled with unknown materials by 1979, and the site has apparently remained generally unchanged since that time.

Previous investigation of Site K has been limited to a review of the historical photographs. No field investigations have been conducted at the site.

Data Assessment and Recommendations

No sampling and/or analytical data has been developed to date for Site K. Since other sand pits/disposal operations in the area have shown significant contamination, it is entirely possible that the disposal of hazardous materials did occur at this site. Field activities scheduled for Site K consists of collecting three subsurface soil samples and conducting soil gas and ambient air surveys. This sampling should be adequate to determine the presence of wastes and also indicate if further investigation is necessary. If contamination is detected, additional attempts should be made to locate information concerning past operations at the site. Additional subsurface soil sampling and installation and sampling of groundwater monitoring wells should then be carried out. contamination is detected, this added investigation would be essential in order to complete feasibility study activities. addition, depending upon subsurface conditions identified. geophysical investigation may be of value to delineate pit boundaries as well as determine the presence of subsurface drum disposal.

Site Description

Site L is the location of a former surface impoundment used by the Harold Waggoner Company to dispose of wash water from a truck cleaning operation. The impoundment was situated approximately 250 feet south of the present Metro Construction Company building, and approximately 125 feet east of Dead Creek (Figure L-I). The site is now covered with black cinders, and is used by Metro Construction Company for equipment storage. Several rows of heavy equipment are presently stored in the immediate area of the former impoundment. This equipment should be moved prior to any field activities.

Site History and Previous Investigations

Waggoner Company, owned and operated by Harold Waggoner, specialized in hauling industrial wastes for companies in the St. Louis/Metro East area. Harold Waggoner operated the company from 1964 to 1974, when he sold the operation to Ruan Trucking Company. Prior to 1971, Wagonner reportedly discharged wash water from truck cleaning operations directly to Dead Creek. In August 1971, the IEPA ordered Waggoner to cease discharging wastes to the creek. Subsequently, a pit was excavated for the purpose of storing wash waters, and the pit was used by Waggoner until 1974. Based on a review of historical photographs, the dimensions of this pit were determined to be roughly 70 feet by 150 feet. Ruan Trucking reportedly continued this practice of wash water storage until 1978. The property was then leased, and later purchased, by Tony Lechner of Metro Construction Company.

The IEPA calculated a rough estimate of the quantity of wash water disposed of in the impoundment between 1971 and 1978. This estimated volume, 164,000 gallons, is based on the assumption that Ruan Trucking operated at the same volume as Waggoner. The estimate is useful as a starting point for further calculations concerning

expected leachate migration rates and plume characteristics in the ground water aquifer. It should be noted that the impoundment was not lined, and the base consisted of medium to coarse grained sands.

Site L was identified in the IEPA St. John Report as a source of both ground water and surface water contamination in the area. The IEPA study included collecting several soil/sediment samples and one groundwater sample from areas downgradient of Site L. Results from analyses of sediment samples are presented in Table B-1, located in the Creek Sector B portion of this report. Results from the analyses of groundwater samples from the monitoring well downgradient of Site L (well G109) are included in Tables B-6, B-7, and B-8 (Creek Sector B).

Monitoring well G109, located approximately 100 feet west of the former impoundment, was found to be the most polluted well during IEPA's preliminary investigation. Also, during the installation of G109, drillers became nauseous from fumes at the well location. Initial sampling conducted by IEPA on October 23, 1980 indicated the presence of chlorophenol, phenol, and cyclohexanone, along with relatively high levels of heavy metals (Table 8-6). Analyses from subsequent sampling events did not show organic contaminants, other than phenol. Arsenic, cadmium, copper, nickel, and phosphorus were detected at quantities significantly above IEPA's water quality standards. Other IEPA monitoring wells adjacent to the creek showed concentrations of these contaminants at least an order of magnitude (10 times) less than those found in 6109. No other likely sources of contamination are known to exist in the immediate area. In view of these points, it is likely that contaminants found in well GlO9 are attributable to the former disposal impoundment (Site L).

Surface soil samples collected in the vicinity of Site L during the IEPA study include X106, X120, and X125 (Figure L-1). Samples X106 and X125 were taken from the creek bed, and X120 was taken from surface soil east of the creek in the general vicinity of the

Data Assessment and Recommendations

Investigations planned for Site L during the RI include subsurface soil sampling and soil gas monitoring. Ambient air monitoring will also be conducted as for all sites in the project.

Further activities necessary to provide adequate data for the feasibility study should include installation and sampling of 3 to 4 monitoring wells, and collecting additional subsurface soil samples. Subsurface soil sampling would be done in conjunction with well installation, and would provide additional data concerning migration of contaminants. The hydrology of the area also needs to be assessed to determine the interaction, if any, between the ground water and the creek.

Preliminary geophysical investigations and subsequent acquisition of historical aerial photographs indicate the likely presence of waste residues extending to the farmland to the south of Site L. Accordingly, additional surveys should be conducted south of the area initially surveyed. Additional geophysical investigations would allow better definition of the impoundment boundaries and also aid in delineating off-site migration of contaminants.

Site Description

Site M is a sand pit excavated by the H.H. Hall Construction Company in the mid to late 1940's. The pit is located immediately east of Dead Creek, and approximately 300 feet north of Judith Lane in Cahokia, Illinois (Figure M-1). The dimensions of the pit are approximately 275 by 350 feet. Presently, Site M is enclosed by a chain link fence, which also surrounds Creek Sector B. residential area is located just east of the pit on Walnut Street. which earlier served as an access road to Site M. excavated prior to any residential development on this street. Observations suggest that the pit is apparently isolated from Dead Creek by an embankment; however, this embankment may not be continuous. Aerial photographs indicate that a small break in the southern part of the embankment may allow flow between the creek and This possibility is supported by past IEPA inspections indicating discoloration in the pit similar to that observed in Dead Creek.

Site History and Previous Investigations

No information is available on file concerning waste disposal activities at Site M. It is possible that disposal did occur, since access to the pit remained unrestricted until a snow fence was erected in 1980. From review of historical aerial photographs, it is evident that minor changes in the dimensions of the pit have occurred. This could be an indication of filling around the perimeter of the pit. IEPA and the Cahokia Health Department have received numerous complaints about Site M and the creek from residents in the area. These complaints address, for the most part, seepage of odoriferous water into basements and problems associated with well water used to water gardens and lawns.

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IEPA sampled several private wells in the area during the preliminary

hydrogeological study conducted in 1980. In addition, one sample of basement seepage from a home on Walnut Street near Site M was collected. Analytical results of these samples are presented in Table B-9, located in the Creek Sector 8 portion of the report. The results show concentrations of copper, manganese, and phosphorus above the state's water quality standards in one or more wells as well as in the basement seepage sample.

In conjunction with the creek sampling done in 1980, IEPA collected sediment and water samples from Site M. Analytical data for these samples are presented in Table M-1. In general, the water samples showed no significant contamination, although water quality standards for copper, phosphorous, and zinc were exceeded. Trace levels of PCBs (0.9 to 4.4 ppb) were found in both samples. The sediment samples, however, did show fairly high levels of several contaminants, including cadmium, chromium, copper, lead, nickel, zinc, and PCBs. In general, the samples closer to the break in the embankment separating Site M from Dead Creek showed higher levels of contaminants than the other samples.

Because water levels in the pit were approximately two feet higher than those found in the closest monitoring wells, the IEPA study concluded that there is no hydrological connection between water in the pit and the ground water aquifer. This assessment may or may not be accurate.

Data Assessments and Recommendations

The IEPA study conducted in 1980 showed significant contamination at Site M and identified specific waste types present. Investigation of Site M for the Dead Creek Project includes collecting two surface water and three sediment samples. A soil gas survey and ambient air monitoring will also be conducted at Site M. This sampling program will not provide sufficient data to adequately evaluate remedial alternatives. Core samples should be collected from the bottom of the pit in order to determine the types of wastes present and the

extent of vertical migration of contaminants that has occurred. In addition, several borings should be completed around the perimeter of the pit, including the embankment between the pit and the creek. It would also be necessary to verify that there is no hydrological connection between the water in the pit and the ground water aquifer. This would be best accomplished using continuous recording gauging stations at wells in the vicinity of the creek and at the pit. These activities would provide the information necessary to proceed with a viable remedial program.

SITE N - H.H. HALL CONSTRUCTION CO.

Site Description

Site N is an operations and equipment storage facility for the H. H. Hall Construction Company of East St. Louis. The site is located in a residential/commercial neighborhood in the town of Canokia, Illinois. Site N is bordered on the north by residential property along Judith Lane; on the west by Dead Creek; on the south by residential property along Edwards Street, and on the east by Falling Springs Road. The entire facility covers approximately 23 acres. Access to the site is restricted by a chain link fence.

Site History and Previous Investigation

Historical photographs indicate that a borrow pit existed at the facility which may have been used for waste disposal. The borrow pit, located in the southwest corner adjacent to Dead Creek, is roughly 4-5 acres in size (Figure N-1). No file information has been located concerning waste disposal at Site N. The pit has been filled and covered.

Historical photographs indicate that excavation at Site N began sometime prior to 1950. The presence of water in the pit was displayed in photographs from 1950, suggesting excavation into the Henry Formation aquifer. Hall Construction Company officials were recently contacted in an attempt to gather further information about the site. Apparently the pit was excavated in the late 1940's as a borrow pit for road construction materials. According to the officials contacted, concrete rubble and other demolition debris are the only wastes disposed of in the pit by Hall Construction. The area is presently covered with rubble and debris and is used only for equipment storage.

Although no analytical data has been developed for Site N, it should not be overlooked as a possible source of contamination in the area.

The site is located adjacent to Greek Sector C of Dead Greek, which has shown elevated levels of several contaminants, including PGBs. At this time, it cannot be determined if the contamination in Greek Sector C is the result of flow from the heavily-contaminated Greek Sector B, or the result of other unknown sources. It is also not known if access to Site N has always been restricted. Accordingly, the possibility exists that other parties may have used the pit for disposal.

Data Assessment and Recommendations

No sampling or field investigation data is presently available for Site N. Field activities scheduled at Site N during the Dead Creek Project include collecting three surface and two subsurface soil samples. In addition, a soil gas survey and ambient air monitoring will be conducted at the site. These investigations should be adequate to characterize the types of wastes present. The results of this sampling should also indicate if further investigation of the site is warranted.

If contamination is identified at the site, additional subsurface soil sampling and installation and sampling of groundwater monitoring wells should be carried out. This added investigation would be essential to complete feasibility study activities. In addition, depending upon subsurface conditions identified, a geophysical investigation may be of value to delineate pit boundaries and determine the presence of subsurface drum disposal. The hydrology of the creek in relation to the site should also be assessed to determine the potential for discharge from the pit to the creek.

Site Description

Site 0 is the Sauget Waste Water Treatment Plant and related property, located on Mobile Avenue in Sauget, Illinois. The property covers approximately 45 acres in a heavily industrialized area. The site consists of a series of four inactive sludge dewatering lagoons and a separate area of contamination. The former sludge lagoons cover approximately 20 acres to the south of the treatment plant buildings, and the identified contaminated area (3 acres) is located immediately west of the Sauget Waste Water Treatment Plant on the northwest corner of the property.

Site History and Previous Investigations

The Sauget Treatment Plant has been in operation in some form since approximately 1952. The plant primarily treats effluent from area industries, but also provides treatment for the entire Village of Sauget. Approximately ten million gallons per day (MGD) of waste water is treated at this facility, of which over 95 percent is from industrial sources. Area industries served by the Sauget Treatment Plant include Monsanto Chemical, Cerro Copper, Sterling Steel Foundry, Amax Zinc, Rogers Cartage, Edwin Cooper, and Midwest Rubber. Effluent from the treatment plant is directed to a National Pollutant Discharge Elimination System (NPDES) permitted discharge point in the Mississippi River.

The treatment plant has a long history of NPDES permit violations, for the most part due to the chemical quality of the plant effluent. Mercury, PCBs, and organic solvents have been detected at concentrations exceeding permit limits on several occasions. A USEPA study conducted in 1982 concluded that the treatment plant waste water contributed a substantial volume of priority, toxic pollutants annually to the Mississippi River. Since operations began, the plant has undergone several modifications and upgrades, increasing both

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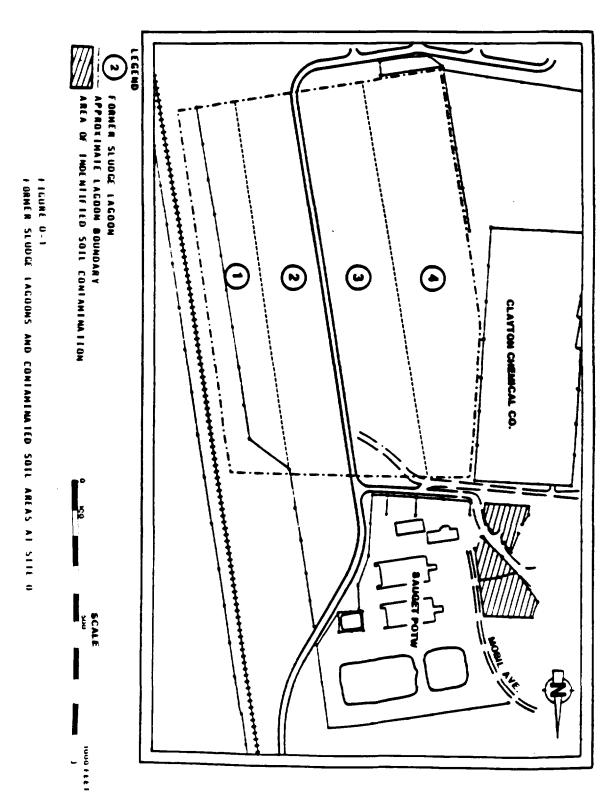


TABLE 0-1: IDENTIFIED ORGANIC COMPOUNDS IN

SAMPLES FROM TRENCH EXCAVATION AT SITE O (COLLECTED JULY 20, 1984 BY RUSSELL AND AXON, INC.)

SAMPLE LOCATIONS

PARAMETERS	SAMPLE 1	SAMPLE 2	BLANK
2,4-Dichlorophenol	50.1	JAMES &	SLANK
Pentachlorophenol	3,600	159	}
2.4.6-Trichlorophenol	39.3	133	
	123	2.2	
Crysene Benzo-k-Fluoranthene	15.9	0.45	
	10.9	0.43	0 000
Bis(2-Ethylhexyl) Phthalate	10.9	12.2	0.098
1,2-Chlorobenzene		12.2	
1,4-Dichlorobenzene		8.01	
Oi-Butyl Phthalate	100	5.06	0.1
Phenanthrene	100	1.6	
Pyrene	102	2.1	
1,2,4-Trichlorobenzene	65.3	1.6	
PCBs	*	•	
Benzo(a)Pyrene	4.2	1.0	

NOTE: All results in ppm.

Blanks indicate compound not detected.

* Identified, but values cannot be verified.

a Analysis performed by Envirodyne Engineers, Inc. (EEI),

St. Louis, MO.

TABLE 0-3: ANALYTICAL RESULTS FOR SOIL SAMPLES AT SITE O. (SPLIT SAMPLES COLLECTED MARCH 12, 1983 BY IEPA AND EEI)

PARAMETERS

·		PARAME I ERS	
SAMPLE NO. (Depth)	TCDD - IEPAª	TCDO - EEI	COMMENTS
7A (0"- 6") 7B (8" - 16") 8A (0" - 6") 8B (6" - 12) 8C (13" - 18") 8D (18" - 25") 8D (18" - 25")	1.8 77 *	44 Interferences 19 37 56	Ouplicate
9A (0" - 6") 9B (6" - 12") 9C (14" - 21") 9D (22" - 28") 1OA 1OB	0.92 12	13	Control Sample Control Sample
11A (0" - 6") 11B (G" - 18") 12 (10" - 19") 13A (0" - 7") 13B (7" - 18") 14 (0" - 6") 15 (0" - 16") 16 (0" - 18")	13 25	13 170	Composite of soil samples

NOTE: All results in ng/g (ppb).

Blanks indicate below detection limits.

* Sample not collected by IEPA.

a Hazelton Raitech, Inc. performed TCDD analysis for IEPA.

Data Assessment and Recommendations

Based on the information outlined above, there is significant and widespread contamination in the area of the Sauget Treatment Plant. Additional information is available from Russell and Axon, Inc., and further attempts should be made to secure all data pertaining to chemical wastes in the area from this contractor. A significant amount of analytical data has been generated for the contaminated area west of the treatment plant. However, the horizontal and vertical extent of contamination has not been assessed. Similarly, very little data is available with respect to the former sludge lagoons which would be useful in proposing remedial alteratives.

The present scope of work for this project includes only collecting and cataloging all data pertaining to Site O. Wastes have been characterized in the area west of the treatment plant, and two major contaminants have been identified to a depth of 28 inches in this area. Data is also available from samples taken in the vicinity of the former sludge lagoons which provides an indication of possible waste types present in the lagoons. The approximate boundaries of the lagoons can be determined based on a review of historical aerial photographs. The data generated to date for Site O indicates that further field investigation is warranted. In order to define specify remedial alternatives, the areas of surface and subsurface soil contamination need to be accurately defined. addition, since the sludge lagoons are not lined, and may have been excavated into the Henry Formation aquifer, a strong possibility for ground water contamination exists.

For the former sludge lagoons, it is recommended that soil borings be completed into the lagoons to a depth sufficient to assess the vertical migration of contaminants from the lagoons. The borings should be located so as to provide intersecting cross sections for mapping purposes, and should cover the entire lagoon area. Samples should be composited for ten foot intervals for each boring and analyzed for all hazard substance list (HSL) compounds. These

Site Description

Site P is an inactive, IEPA-permitted landfill covering approximately 20 acres in Sauget, Illinois (Figure P-1). The site is bordered on the west by the Illinois Central Gulf Railroad; on the south by Monsanto Avenue, and on the east by the Terminal Railroad Association railroad. The two railroads converge to delineate the north boundary. Generally, the geology at the site consists of silty sand, underlain by fine grained to silty clay, followed by fine to coarse grained sands down to the bedrock. Surface drainage is to the south-central portion of the site, which was not landfilled due to the presence of a potable water line in this area. A depression area is also found along the east perimeter, adjacent to the Terminal Railroad. Surface drainage will not leave the site due to the presence of railroad embankments along the perimeter and the depression in the central portion of the site.

Site History and Previous Investigations

Sauget and Company entered into a lease agreement with the Union Electric Company in St. Louis to operate a waste disposal facility in 1972. In January 1973, IEPA issued an operating permit to Sauget and Company to accept only non-chemical waste from Monsanto. Sauget and Company subsequently applied for, and was granted, a supplemental permit in 1974 which allowed acceptance of general waste and diatomaceous earth filter cake from Edwin Cooper, Inc. (now Ethyl Corp.). The IEPA began conducting routine inspections of the facility in 1974, at which time no violations were evident. In October 1975, an inspector observed a small amount of yellowish, tar-like liquid in an area adjacent to several crushed fiber drums which were labelled "Monsanto ACL-85, Chlorine Composition." Sauget and Company and Monsanto were subsequently notified of this permit violation, and the matter was not further addressed. The site was operated in general compliance until December 1977, when an

inspection revealed the disposal of approximately 25 metal containers (12-15 gallon) full of phosphorus pentasulfide (P_2S_5) , a flammable solid. Monsanto was required to excavate and remove all of this material from the site, and to discontinue disposal of any chemical wastes or packagings.

The IEPA became aware of another potential problem at this time, specifically the use of a Southern Railway slag pile for intermediate and final cover material. Analysis of this slag showed it to be unsuitable as cover due to its high permeability and heavy metal content. Cinders were also used as cover material at Site P, and are expected to pose the same problems as the slag; that is, increased surface water infiltration and the resulting potential for leaching heavy metals along with organic wastes into the groundwater.

State inspections in 1978 and 1979 indicated unpermitted disposal of Monsanto ACL filter residues and packagings. The composition of this material is not known. According to the site operator at that time, this material would occasionally ignite when in contact with the filter cake waste from Edwin Cooper.

An Illinois American Water Company distribution main was discovered in 1980 during preparatory excavation on the southern portion of the site. The south one-third of the property was purchased from Illinois Central Gulf in 1971 by Paul Sauget. Following discovery of the water line, Site Plans and permits were modified to include no waste disposal within 100 feet of the line.

Review of available IEPA records indicates that the Edwin Cooper filter cake is the only industrial process waste that was reported to have been disposed of at Site P. Records indicate that approximately 117,000 cubic yards of this material was accepted. The filter cake was classified as non-hazardous on special waste authorization permit number 7400017, based on EP toxicity results submitted in 1973. Additional analytical data is available for a filter cake composite sample from Edwin Cooper in 1979 which indicates elevated levels of

SITE Q - SAUGET/SAUGET LANDFILL

Site Description

Site Q is the Sauget/Sauget Landfill, an inactive waste disposal facility operated by Sauget and Company between the years 1966 and 1973. The site is approximately 90 acres in size, including a southern extension, as delineated by the Alton and Southern Railroad tracks (Figure Q-1). The site is located on east bank of the Mississippi River and is also on the river side of a U.S. Army Corps of Engineers flood control levee. Site Q is also situated immediately east of Site R, commonly known at Sauget Toxic Dump, a chemical waste disposal facility owned by the Monsanto Chemical Company.

Site Q was operated without a permit from IEPA, although registration with the Illinois Department of Public Health was obtained for the north site in 1967, prior to the formation of the IEPA. The site is presently covered with black cinders, which is an unsuitable cover material due to its high permeability. Site Q is presently owned by the Riverport Terminal and Fleeting Company, and the property is leased to the Pillsbury Company. Pillsbury operates a coal unloading facility at the site.

Site History and Previous Investgations

Disposal operations at Site Q began in approximately 1966 in the northernmost portion of the property. A Union Electric Company flyash pond existed at the site in an area immediately south of Monsanto's chemical dump. IEPA inspections in the early 1970's documented several violations of the Illinois Environmental Protection Act, including open burning, use of unsuitable cover materials (cinders and flyash), and acceptance of liquid chemical wastes. Septic tank pumpings were also accepted at the site from approximately 1968 to 1972, and were apparently co-disposed with general municipal refuse.

ompany for the violations mentioned above. The company was ordered to cease and desist open burning, accepting liquid chemical wastes, open dumping, and use of cinders and flyash as cover material. In July, 1972, a smoldering underground fire was observed by ISPA inspectors at the site. The fire continued to smolder until October, 1972 despite repeated attempts to extinguish it. Underground fires were a continuing problem, as documented by later ISPA inspection reports. In the spring of 1973, flood waters from the Mississippi River inundated Site Q. This condition persisted into the fall, and operations at the site were discontinued. Exposed refuse was observed being carried downstream in the river at that time.

Sauget and Company filed a permit application to IEPA in 1972 for a proposed extension to the existing landfill. The proposed extension was located south of the Alton and Southern railroad tracks, and will be referred to as the south site. IEPA denied issuance of a permit for this extension several times, as Sauget and Company had filed repeated applications. Although approval of the south site was never issued, disposal operations continued in this area.

In the early 1970's, IEPA collected several samples from Site O. Approximate sample locations are shown in Figure Q-1. data for samples collected from ponded water, leachate seeps, and ground water are provided in Table Q-1. The first set of samples, collected in October, 1972, consisted of one sample from ponded water, and one leachate sample. The results for these samples show the presence of several metals, including copper, iron, lead, mercury, and zinc. Ground water samples were collected in January, 1973 from two monitoring wells at Site Q. Information regarding construction details for these wells has not been located. GW-1 showed trace levels of cadmium, silver, and phenols, while GW-2 showed very little evidence of contamination. Samples were again collected by IEPA from ponded water at Site Q on two occasions in April, 1973. Analytical results showed low levels of boron, cadmium, copper, iron, lead, manganese, mercury, nickel, and zinc in sample P-2 and/or P-3. Although the data from samples collected in the early 1970's showed the presence of several contaminants, most notably phenol and heavy metals, no conclusive evidence of contamination at Site Q was obtained.

IEPA collected samples from leachate seeps along the Mississippi River in October, 1981 and again in September, 1983. The locations of these samples are shown in Figure Q-1, and analytical results are presented in Table Q-2. Data for the 1981 samples shows elevated concentrations of arsenic, chromium, copper, lead, managanese, and phosphorus in both samples. Additionally, low levels of phenols and PCBs were detected in the samples. The samples collected in September, 1983 show very similar results. Heavy metals and PCBs were again detected at concentrations very close to those seen in the earlier samples.

The cinders and flyash used as cover materials at Site Q have been the subject of numerous investigations and complaints by IEPA. In addition, the depth of final cover has been deemed inadequate, and enforcement action is pending on this matter. The Illinois Pollution Control Board Case Number 77-84 was filed against Sauget and Company and Paul Sauget in May, 1977. As a result of the findings in this case, a monetary penalty was invoked, and Sauget and Company was ordered to place two feet of suitable cover material on the entire site by February, 1981. Sauget's failure to comply with these orders led the Illinois Attorney General's office to file a similar case. Site Q has been a chronic enforcement problem, and recently Paul Sauget was found in contempt of court for failure to comply with court orders.

Laboratory tests run on the cinders and flyash indicate permeability values in the range of 9 x 10^{-3} centimeters per second, which is considered unsuitable by IEPA. In addition, metals analysis of the cover material showed unacceptably high levels of arsenic, copper, lead, and zinc. In 1972, IEPA collected samples from stockpiled flyash at Site Q, and ran leach tests for inorganic constituents.

Samples were taken from piles estimated to be 5 years old, 1 year old, and fresh material to determine the types and quantities of contaminants being leached from this material at the site. Analytical data for these samples are shown in Table Q-3. Analysis of the first set of samples (August, 1972) shows a distinct trend of the more soluble compounds, such as calcium, sodium and potassium, being leached from the fresh ash. However, the second set of samples, collected in October 1972, does not show a similar trend. The reasons for this discrepancy are not clear. The data in Table Q-3 also shows that significant quantities of metals are contained in the ash, particularly for the material estimated to be five years old.

IEPA's Notices of Violations concerning disposal of chemical wastes at Site Q in early inspections are supported by more recent information. Notification of Hazardous Waste Site Forms were submitted to USEPA from three companies for this site. These notifications indicate disposal of organics, inorganics, solvents, pesticides, paint sludges, and unknown wastes at the site. In May, 1980 workers uncovered buried drums and unknown wastes while excavating for construction of a railroad spur on the property. Workers observed a haze or smoke rising from the material after it was uncovered, suggesting corrosive and/or reactive properties.

In November, 1985, IEPA received a sketch from a reporter for a St. Louis newspaper indicating the location of buried drums containing PCBs. The reporter's source of this information is not known, nor has the information been verified to date.

As a result of the May, 1980 incident in which buried drums were unearthed, USEPA tasked its FIT contractor (Ecology and Environment, Inc.) to perform a detailed study to determine the extent of chemical contamination at Site Q. The study included a systematic geophysical investigation using EM, magnetometry, and ground penetrating radar (GPR), followed by a drilling and sampling program to investigate possible subsurface contamination. The investigation was limited

to the northern portion of the site which amounts to approximately 25 percent of the site area.

Technos, Inc. of Miami, Florida was contracted to perform the geophysical investigation. This investigation was completed in June 1983. Results of the geophysical investigation identified the probable limits of landfilling and burial zones of relatively large concentrations of iron bearing materials such as drums or car bodies. These iron bearing zones were found in several distinct locations in the north-central and western portions of the study area.

Following the geophysical investigation, a drilling/sampling program was conducted to determine if subsurface soils were contaminated. The program consisted of drilling 18 test borings through the landfill, and collecting 35 soil samples for full priority pollutant analysis, as designated by USEPA. Subsurface soil samples were collected at depths ranging from 10 to 26 feet. Sample locations are shown in Figure Q-2. Analytical data for the soil samples are shown in Table Q-4, which consists of five pages. As can be seen in the table, a wide variety of organic compounds were detected at high concentrations in these samples. The sample analysis consisted of testing for 112 organic compounds, and 63 compounds were confirmed to be present in the subsurface samples.

Specifically, the data showed that thirty-four organic compounds were found at concentrations of 10 ppm or greater. Of these 34 compounds, 20 compounds were detected at concentrations 100 ppm or greater. And of these 20 compounds, 7 compounds were detected at concentrations of 1000 ppm or greater. Compounds detected at concentrations of 1000 ppm or greater include 2,4-dichlorophenol, 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, bis(2-ethylhexyl) phthalate, toluene, o-xylene, and PCB-1260. In addition, 2,3,7,8-TCDD was detected in two samples (848 and 888). Compounds detected in samples taken from Site Q include many of the same compounds as detected in samples taken from Site R, the Sauget Toxic Dump site. Contamination was detected

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cover material, and to provide an estimate of leachate production. The ground and surface hydrology should be assessed over a period of time sufficient to address seasonal fluctuations. This assessment would provide data to determine ground water discharge and recharge in relation to the river. Additional investigation, if necessary, would be proposed following the completion of these activities.

Site Description

Site R is the Sauget Toxic Dump, an inactive industrial waste landfill used by the Monsanto Chemical Company between the years 1957 and 1977. Site R occupies approximately 36 acres adjacent to the Mississippi River in Sauget, Illinois. The site is located immediately west of Site Q, commonly known as the Sauget Landfill. Site R is presently covered with a clay cap and vegetated, and drainage is directed to ditches around the perimeter of the site. A Monsanto feedstock tank farm is located adjacent to the site on the northwest side.

Site History and Previous Investigation

Site R, also known as the Krummrich Landfill, was operated by Sauget and Company under contract with Monsanto. According to an Eckhardt Report summary sheet submitted in 1979 by Monsanto, approximately 262,500 tons of liquid and solid industrial wastes were disposed of at Site R from Monsanto plants in Sauget and St. Louis. In 1981, Monsanto submitted two Notification of Hazardous Waste Site Forms for Site R to the USEPA. The Monsanto W.G. Krummrich Plant (Sauget) listed 290,000 cubic yards (c.y.) of organics, inorganics, solvents, pesticides, and heavy metals as having been disposed at Site R. The Monsanto J. F. Queeny Plant (St. Louis) listed 6600 c.y. of the same waste types as above. Both notifications also indicated belowground disposal of drums.

Monsanto has also submitted two reports to IEPA outling waste types and volumes disposed of at Site R for the years 1968 and 1972. Data compiled from these reports are summarized in Table R-1. This tabulation shows that the volume of wastes landfilled in 1972 was significantly lower than that in 1968. This reduction reflects the elimination of several major production operations at Monsanto's Krummrich Plant. By 1975, the majority of chemical waste disposal at

Site R had been terminated, as wastes were either hauled to other disposal facilities or incinerated on the plant site.

Very little information is available concerning disposal activities at Site R prior to 1967. In March, 1967, Sauget and Company filed an application for registration to operate a refuse disposal facility to the Illinois Department of Public Health. Health Department inspection reports from 1967 indicate disposal of liquid chemical wastes and metal containers from Monsanto. Liquids were pumped from tank trucks and drums into several pits around the site. Cinders were used as intermediate cover material.

In August, 1968, the Illinois Department of Public Health collected five ground water samples from on-site monitoring wells. The locations of these wells are shown in Figure R-1, and analytical results are presented in Table R-2. Phenols were detected in all wells at concentrations ranging from 15 to 1220 ppb. Alkalinity and total solids were also analyzed for, but no significant conclusions can be made from the data for these parameters.

IEPA began making routine inspections at Site R in 1971. Photographs of the site at this time suggest that wastes were disposed of in direct contact with the ground water. No segregation of liquid wastes was apparent in these photographs. IEPA collected another set of samples from the monitoring wells in December, 1972. Analytical data for these samples are shown in Table R-3. The results indicate concentrations of iron, zinc, and phenol above the State's water quality standards. Oil was also detected in wells MN-1 and MN-4. Samples were also collected from waste ponds at Site R by IEPA in January, 1973 and analyzed for phenol. Two samples were collected from pits identified as crystallization ponds, and one sample was taken from a spent caustic pond. Results for the waste pond samples are shown in Table R-4. High concentrations of phenols were detected in all samples.

In 1973, IEPA sent notices to Sauget and Company and Monsanto

TABLE R-2: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED AUGUST 22, 1968 BY THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH)

SAMPLE LOCATIONS

PARAMETERS	MW-1	MW-3	MW-4	MW-5	MW-6
Total Solids (conductivity membos) Alkalinity (ppm)	320 172	300 148	2 80 15 6	250 124	500 248
Phenol (ppb)	1220	25	20	15	1200

TABLE R-4: ANALYSIS OF SURFACE MATER SAMPLES FROM WASTE PONDS AT SITE R (COLLECTED JANUARY 18, 1973

BY IEPA)

SAMPLE LOCATIONS

PARAMETER	CRYSTALLIZATION POND 221	CRYSTALLIZATION POND 270	SPENT CAUSTIC POND
Phenol	2800	50,000	2,000

NOTE: Results in mg/l (ppm).

TABLE R-5: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED FEBRUARY 22, 1973 BY IEPA)

SAMPLE LOCATIONS

				``	
PARAMETERS	MW-1	MH-2	MV-4	MW-5	RANNEY WELL
Iron	6.8	11	0.8	6.6	1.9
Manganese	0.35	0.55	0.05	1.05	0.92
Mercury (ppb)	0.4			0.2	
Zinc	1.9	0.6		1.5	
Ammonia .	1.6	2.6	0.7	1.3	0.98
Phenol (ppb)	150	80			7500
800	31	48	1	1	85
COD	51	78	16	13	220

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limits.

TABLE R-7: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED OCTOBER 28, 1975 BY IEPA).

SAMPLE LOCATIONS

		SAMPLE CO	CA 1 10113	
PARAMETERS	RANNEY WELL	MN-2	MW-4	MW-5
Ammonia				
Arsenic	0.002		0.002	
Barium	0.1	0.1	0.1	0.2
Boron	0.7	0.9	0.5	0.2
Cadmium				
COD	345	210	12	16
Chloride	110	200	23	20
Cyanide		0.02	0.01	
Iron	4.5	13.4	1.45	11
Lead	0.02		0.01	0.04
Manganese	1.3	0.2	0.1	0.7
Nitrate		0.3	0.2	0.1
011	3	6	7	
Pheno1	19	1.1	0.025	0.013
R.O.E.	300	920	230	200
Selenium	0.02			
Sulfate	95	6	22	15
JULIACE				

NOTE: All results in mg/l, (ppm). Blanks indicate not detected. wells were installed. The D'Appolonia study concluded that the landfill area consisted of 5 to 20 feet of flyash, cinders, silty clay, and unidentified waste. The landfill is underlain by alluvium, consisting of fine sands, silt, and clay ranging in thickness from 5 to 50 feet. Field permeability tests showed that alluvium is fairly permeable (1 x 10^{-3} cm/sec) suggesting that silty sand is the major component of the alluvium. This finding is supported by the evidence of vertical migration of contaminants to a depth of 65 feet, as suggested in the boring logs. Water levels were generally 25 to 30 feet below ground surface.

In May, 1978, Monsanto filed closure documents to IEPA detailing a closure plan for the site. In general, the plan consisted of specifications for the installation of a drainage system and clay cap, along with details for grading, seeding, and access restriction. The Helmkamp Construction Company was retained to implement the closure plan. An IEPA inspection report from October, 1979 indicated that closure operations at Site R were complete, including installation of a clay cap 3 to 6 feet in thickness. In February, 1980, Richard Sinise, an Environmental Control Engineer for Monsanto, filed an Affidavit of Closure for Site R.

IEPA personnel collected ground water samples from monitoring wells installed by O'Applonia in October, 1979 (Figure R-1). The samples were analyzed for inorganics and organic parameters reported by Monsanto to have been disposed of at the site. Analytical results for these samples are shown in Table R-9. Analysis showed the presence of several organic contaminants in the wells. Both shallow (25 to 35 feet) and deep (60 to 70 feet) wells were sampled, and chlorotoluene and phenol were found in all wells sampled. Well B-19S, located in the southeast portion of the site, also showed chlorophenol, dichlorobenzene, and diphenyl ether at concentrations ranging from 0.81 to 2.1 ppm. Iron, copper, and zinc exceeded water quality standards in several wells. Another set of samples was

collected by the IEPA from the D'Appolonia monitoring wells in March, 1981. These samples were analyzed specifically for organic compounds. Analytical data for these samples are shown in Table R-10. Concentrations of organic contaminants were detected in all wells sampled. Chlorobenzene (130 to 3000 ppb) was detected in all wells, while biphenylamine, chlorophenol, dichlorobenzene, and dichlorophenol were seen in five or more wells.

In October, 1981, IEPA collected leachate and sediment samples at Site R from an area adjacent to the Mississippi River. Leachate and sediment samples were collected from three locations where leachate seeps were observed flowing from the landfill into the river. Analytical results for these samples are presented in Table R-11, and locations of the samples are shown in Figure R-1. The three water samples showed contamination with a wide variety of organic PCBs and chloroaniline were detected in all sediment compounds. Other compounds detected in sediment samples included samoles. 2.4-dichlorophenoxy-acetic acid (2.4-0), chloronitrobenzene, dichloroaniline, chlorophenol, biphenyl-2-ol, and dichlorophenol. presence of 2,4-D and chlorinated phenols in these samples suggested that dioxin was also a potential contaminant at the site. The IEPA subsequently requested assistance from USEPA in securing a laboratory to perform dioxin analysis on leachate samples from Site R. November, 1981 a USEPA contractor (Ecology and Environment, Inc.) collected leachate and sediment samples at three locations adjacent to the river (Figure R-1). A total of eight samples plus three blanks were collected. Dioxin analysis was performed by the Brehm Laboratory at Wright State University. Monsanto obtained split samples and analyzed for chlorinated dibenzo-p-dioxins (CDOs), select organics, and metals. The USEPA samples were analyzed for tetra through octa CDOs and dibenzofurans (CDFs), select organics, and metals. Table R-12 provides an explanation and cross-reference for samples collected by USEPA and Monsanto.

Analytical results for CDOs and CDFs in the USEPA leachate samples

TABLE: 8-11: AMALYSIS OF LEACHAIE AND SEBINEMI SAMPLES FROM SITE R (COLLECTED BCTORER 2, 1961 BV 16PA)

PARAMETERS	SAMPLE A (MATER) MECHAN	SAPLE B (MATER) BOZZEB	CHATER)	5011 SAPPLE A 6022690	2011 SAMPLE B	SOIL SAMPLE (
1			9.2	3	25.1	97,2
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tydrosybonsolc Ac16/	13 000					
A D LANGE	8	4000	23,000			
	900	200	9			

IIE: All results in ppb.

Blanks indicate below detect

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are shown in Table R-13. Tetra- and penta-CODs and COFS were not detected in any of the samples. However, higher chlorinated droxins and furans (hexa through octa isomers) were detected in three of the five samples submitted for analysis. Concentrations of these compounds ranged from 4.5 to 2693 parts per trillion (ppt). The two remaining samples, SO7 and RO1, were water blanks, and showed no detectable CODs or COFs. Monsanto also analyzed samples MO1 through MO5 for CDDs, and results showed no detectable concentrations of these compounds.

Inorganic data for the leachate and sediment samples from Site R are shown in Tables R-14 and R-15. In general, the leachate samples did not show significant inorganic contamination, although concentrations of chromium, copper, boron and iron exceeded water quality standards in two or more samples. Cyanide was detected in several samples, but was also found in the blank. Therefore, the results for cyanide should be considered unreliable. Data for the sediment samples show more substantial evidence of contamination. Elevated levels of arsenic, chromium, copper, lead, and barium were found in several Identified organic compounds in leachate and sediment samples are listed in Table R-16. Phenol and chlorinated phenols were found in all but one sediment sample (MO2) at concentrations ranging from 0.2 to 300 ppb. Leachate samples showed elevated levels of several organic parameters, including chlorinated phenols, chlorinated benzenes, chloroanilines, and 2,4-0. As shown in Table R-16, there is a significant discrepancy in the Monsanto and USEPA data for the sediment samples. The values listed by Monsanto were consistently and substantially higher than USEPA values. This may be explained by the fact that USEPA's samples were initially analyzed as Because of the higher detection limits medium hazard samples. associated with this analysis, no contaminants were initially found. USEPA subsequently decided to rerun the samples at lower detection limits. It is possible that the increased holding time and handling of these samples were instrumental in the reduction of concentrations of contaminants found.

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Site R was assessed using USEPAs Hazard Ranking System (HRS) model in

TABLE R-14: INORGANIC ANALYSIS OF LEACHATE SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

SAMPLE LOCATIONS

				SAMPLE LU	CATIONS			
PARAMETERS	501	M01	_001	503	MO3	S0 5	4 05	P01
Arsenic	0.034	0.02	0.031	0.016	0.025	0.029	0.065	
Mercury	0.0002		0.0002	0.0002	0.0014	0.0008	0.001	
Selenium	0.038		0.032	0.026		0.031		
Thallium								
Antimony								
8eryllium		0.008			0.005		0.008	
Cadmium		0.006			0.007		0.008	
Chromium	0.04	0.086	0.02	0.015	0.075	0.02	0.07	0.01
Copper		0.073			0.092		0. 08	
Lead	0.005		0.008					
Nickel	0.04	0.155			0.124		0.144	
Silver						0.01		
Zinc	0.048	0.216	0.024	0.01	0.216	0.049	0.062	0.31
Aluminum		26.8			30.5		3.22	
Barium		0.5			0.5		0.36	
Boron	19.7	18	17.1	15.35	13.6	21.6	19.1	
Calcium	N/A	368	N/A	N/A	257	N/A	257	N/A
Cobalt		0.03			0.019		0.031	
Iron	0.06	25.5	0.06		30.8	0.63	27.4	
Magnesium	N/A	43.2	N/A	N/A	48.2	N/A	39.8	N/A
Manganese	0.02	6.27	0.32	1.99	2.1	5.4	3.82	0.03
Molybdenum	N/A	0.53	N/A	N/A	0.403	N/A	0.439	4/4
Phosphorus	N/A	0.9	N/A	N/A	0.907	N/A	2.0 6	N/A
Sodium	N/A	40.4	N/A	N/A	41.8	N/A	44.2	N/A
Tin						0.02	1.4	
Vanadium		0.18			0.138		0.17	
Cyanide	0.071	N/A	0.057	N/A	N/A	N/A	N/A	0.13

NOTE: All Results in ppm.

Blanks indicate below detection limits.

N/A - Parameter not analyzed.

RO1 is a water blank.

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			SUPLE	SWELL LOCATIONS	2				·
PARAMETERS	9	LEACHATE	3	€	ä	3	SEDIMENT	3	4
2-Chlorophanol	₹ 5	B		X :		2.0		7.0	
Phone 2.4.6-Irichlorement	2					.	2	0.42	9
1,4-Dichlerebenzene	2				8		8		9
1,2-Bichlerebenzene Bis(2 ethylbanyl) Phibaloto	R				3		2		9
Chlerabenhees	33	23	×						
Chloranilines	9	4000	3						1
Dichlerounilines Chleronitrobenzenes	= 3	88							8
2.4-b	a	2	3		6 .014		M.O. 0		61 0

detected in monitoring wells and leachate samples from Site R as they relate to wastes reported by Monsanto to have been disposed of at the site. Also included in the analysis were chemicals reported as being manufactured at Monsanto's Krummrich Plant, as documented in the 1977 chemical inventory developed as a result of the Toxic Substances Control Act (TSCA) and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The analysis revealed a high degree of association or correlation between chemicals detected in the sample, and those reported to have been disposed of or manufactured by Monsanto. A summary of data from this USEPA analysis report is presented in Table R-17.

In 1984, Monsanto contracted Geraghty and Miller, Inc. to perform a detailed hydrogeologic investigation in the Sauget area. Data from this study, which included the installation of approximately 60 monitoring wells, have not been made available.

Data Assessment and Recommendations

A great deal of data has been developed to date for Site R. Organic contaminants have been detected in both shallow and deep monitoring wells on site, as well as in leachate seeps leaving the site. Evidence of contamination has been observed to a depth of approximately 60 feet in soil borings. A substantial listing of the types and quantities of chemical wastes disposed of at the site was submitted to IEPA by Monsanto. In view of this information the only significant data gaps are: (1) specific delineation of contaminant boundaries, and (2) determination of the presence or absence of air emissions from the site. Because of the permeable nature of the subsurface soils and the characteristics of the wastes present at the site, it is likely that extensive migration of contaminants has occurred.

The present scope of work for the Dead Creek Project includes installation and sampling of monitoring wells at Site R. Ambient air monitoring will also be conducted to determine to what extent, if any, off-gassing of organic contaminants is occurring. Every effort

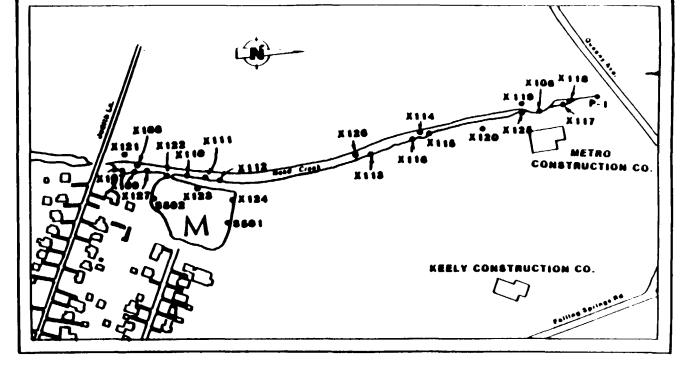
should be made by th IEPA to obtain data on, and gain access to, the Monsanto wells installed by Geraghty and Miller. Access to these wells would likely eliminate the need for, or at least affect the location of, the monitoring wells to be installed during the field investigation of Site R. Pending the results of ground water sampling, a more specific approach to delineating the extent of contamination could be proposed. Samples should initially be collected from a minimum of 8 wells on Site R, and hydraulic conductivity tests should be run on a minimum of 2 deep and 2 shallow wells. Possibilities for identifying plume characteristics include conducting electromagenetic surveys (including off site areas), and soil gas monitoring. In any event, the lateral and vertical extent of contaminantion must be addressed prior to design of remedial options.

Site Description

Creek Sector 8 (CS-8) includes the portion of Dead Creek lying between Queeny Avenue and Judith Lane in Sauget, Illinois. Three other sites in the Dead Creek Project are located adjacent to CS-8. These include Site G to the northwest, Site L to the northeast, and Site M to the southeast. All of these sites have been identified at one time or another as possible sources of pollution in CS-3. Presently, CS-8 and Site M are enclosed by a chain link fence which was installed by the USEPA in 1982. The banks of the creek are heavily vegetated, and debris is scattered throughout the northern one-half of CS-8. Culverts at Queeny Avenue and Judith Lane have been blocked in order to prevent any release of contaminants to the remainder of the creek, although the adequacy of these blocks has been questioned several times. Water levels in the creek vary substantially depending on rainfall, and during extended periods of no precipitation, the creek becomes a dry ditch.

Site History and Previous Investigations

The IEPA initially became aware of environmental problems at CS-B in May, 1980 when several complaints were received concerning smouldering and fires observed the creek bed. In August, 1980, a local resident's dog died, apparently of chemical burns resulting from contact with materials in the ditch. Following this incident, the IEPA conducted preliminary sampling to determine the cause of these problems in CS-8. Chemical analysis of these samples indicated high levels of PCBs, phosphorus, and heavy metals, and the IEPA subsequently authorized the installation of fencing in order to prevent In September 1980, the Illinois public access to the creek. Department of Transportation (IDOT) completed installation of 7000 feet of snow fence with warning signs around CS-8 and Site M. IEPA subsequently performed a preliminary hydrogeological investigation in the area in an attempt to identify the sources of pollution



LEGEND

1106 SED IMENT SAMPLING LOCATION

5502 SURFACE WATER SAMPLING LOCATION

P-1 SUBSURFACE SOIL SAMPLING LOCATION

FIGURE 8-1 TEPA SAMPLING LOCATIONS AT CREEK SECTOR 8 AND STIL M

investigation. In general, inorganic analysis of these samples indicated high levels of several metals in comparison with background conditions (Table 8-3, sample x121).

Subsurface soil samples were also collected by EPA from one location in the northern portion of CS-B during the 1980 investigation. Analyses of samples from boring P-1 are included in Table 3-2. Results indicated the presence of PCBs to a depth of seven feet, and other organic contaminants to a depth of three feet. PC3 concentrations ranged from 9,200 ppm near the surface to 53 ppm at depths greater than 4 feet and up to 7 feet. Other organic contaminants were detected at concentrations ranging from 12,000 ppm near the surface to 240 ppm at 2.5 feet. These results indicate non-uniform contaminant deposition in the northern portion of CS-B, which is common in riverine systems. The above data indicate that historical release(s) of contaminants to the northern portion of CS-B did occur. However, the horizontal and vertical extent of the resulting contamination has not been fully defined.

Analyses of sediment samples from the southern portion of CS-8 are summarized in Table 8-3. Sample x121 was taken from soil outside the creek bed to establish background conditions. Samples x107, x122, and x127 contained PCBs at concentrations ranging from 73 to 540 ppm. Sample x122 also showed diclorobenzene (0.35 ppm). This was the only organic contaminant other than PCBs detected in samples from the southern portion of CS-B. Several metals, including arsenic, cadmium, chromium, copper, lead, and zinc, were detected at levels significantly above background concentrations in all samples. However, the metal concentrations were comparable to concentrations detected in samples of sediment taken in the northern portion of CS-8. All of the samples were collected from the creek bed adjacent to, or downstream from Site M, which is an old sand pit excavated by the H.H. Hall Construction Company in approximately 1950. Hazardous materials were not reported to have been disposed of at Site M.

In October, 1980 IEPA and Monsanto Chemical Company cooperatively

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TABLE 8-3: ANALYSIS OF SOIL SAMPLES IN THE SOUTHERN PORTION OF CREEK SECTOR B (COLLECTED BY IEPA 9-8-80 THROUGH 10-25-80)

				SAMPLE	LOCATIONS			·	
PARAMETERS	×107	×108	×109	x110	x111	x112	x121	x122	x127
Aluminum		8,000	9,100	7,000	8,000	6,600			
Arsenic	6,000	44	25	67	80	50			
Bartum	4,800	3,800	1,600	4,300	1,800	8,000	230	5,500	2,50
Beryl ium	-	•	-	•	-	-	-	2	
Boron	-	-	-	-	-	-	-	_	
Cadmium	70	-	200	40	100	100	1	35	50
Calcium	11,000	10,000	24,000	16,000	13,000	30,000	11,000	15,000	8,000
Chromium	360	300	-	140	50	50	-	50	340
Cobalt	30	30	20	-	-	30	9	15	3(
Copper	32,000	31,000	7,700	22,000	15,000	41,000	100	21,900	28,000
Iron	70,000	58,000	75,000	67,000	68,000	52,000	16,500	50,000	63,000
Lead	24,000	2,000	1,700	2,000	2,000	5,100		1,700	1,700
Magnesium	2,900	3,900	3,600	4,100	4,000	4,000	5,900	3,800	2,700
Hanganese	150	150	300	200	160	300	3/0	190	150
Mercury	•	1.7	3	3.3			-	-	
Nickel	3,500	3,000	900	1,900	2,000	2,700	120	1,700	
Phosphorus	7,040	-	•	-	-		•	L.K.	4,700
Potassium	1,200	1,500	1,700	1,300	1,600	1,200	1,500	9 60	1,000
Silver	40	•	-	-	•	-	_	30	40
Sodium	1,700	900	900	700	1,000	1,600	80	630	700
Strontium	180	200	130	160	160	430	32	190	130
Vanadium	60	•	-	70	100	-	25	45	45
Zinc	25,000	22,000	27,000	25,000	47,000	52,000	230	19,900	28,000
PCBs	120	-	-	-	-	-	_	540	73
Dichlorobenzene	•	-	-	-	_	_	-	0.3	5 -

NOTE:

All results in ppm Blanks indicate that parameter not analyzed - Indicates parameter is below detector limit

TABLE 8-4: ORGANIC ANALYSIS OF SEDIMENT

SAMPLES FROM DEAD CREEK, SECTOR 8 (SPLIT SAMPLES-IEPA AND MONSANTO

COLLECTED 10-2-80)

SAMPLE LOCATIONS

·	SAMPLE COURTIONS								
PARAMETERS	50-1	SD-2	50-3	3!anx*					
CHLOROBENZENES:									
Monochlorobenzene	(0.9)		(0.3)						
p-Dichlorobenzene	370	(0.3)	(0.4)						
o-Dichlorobenzene	80	(0.6)	1						
Trichlorobenzenes	85	1.6	(0.7)						
Tetrachlorobenzenes	6.1	2.4	(0.4)						
Pentacesorobenzene			, ,						
Hexachlorobenzene		1.2							
Nitrochlorobenzenes	120								
CHLOROPHENOLS:									
o-Chlorophenol	3.7								
p-Chlorophenol	6.6		(0.9)						
2,4-Dichlorophenol	1.2		(4.5)						
Pentach1oropheno1	130		1.8						
PHOSPHATE ESTERS:									
Dibutylphenyl Phosphate	330		(0.8)						
Butyldiphenyl Phosphate	-		(0.8)						
Triphenyl Phosphate	2600		(0.0)						
2-Ethylhexyldiphenyl			2.2						
Phosphate			•••						
Isodecyldiphenyl Phosphate									
T-Butylphenyldiphenyl									
Phosphate	28								
Di-t-butylphenyldiphenyl Phosphate									
Nonylphenyl Diphenyl Phosphate									
Cumylphenyldiphenl Phosphate	3.7								
PCBs (C1 ₂ to C1 ₆ Homologs)	13,000	240	45						

NOTE: All values in ppm

*Soil blank collected from Missouri Bottoms, St. Charles, Mo.
Blanks indicate below detection limits
() Semi-quantitative values

sampling of 12 monitoring wells in addition to the 1980 soil/sediment sampling described above. Residential wells were also sampled to determine ground water quality in the area. Locations of 1894 monitoring wells and residential well samples are shown in Figure 8-2. All IEPA wells were screened in the Henry Formation sands, with screened interval elevations ranging between 366 and 402 feet Mean Sea Level. The hydraulic gradient in the vicinity of 68-8 is very flat, with ground water flow generally to the west toward the Mississippi River.

Analytical data for three sets of samples from the IEPA monitoring wells, corresponding to three sampling events in 1980 and 1981, are presented in Tables 8-6, 8-7, and 8-8. Well G108 can be considered a background well due to its location upgradient from the known disposal areas around CS-B. Organic contaminants were consistently found in Wells G107 and G112. These wells are in downgradient monitoring positions for sites 6 and I respectively. Certain organic contaminants were detected in Wells 6102, 6109 and 6110 during the initial sample event, but these wells did not show any of the organics in subsequent samples. Well G102 is located immediately west of the northern portion of CS-8, and near the southeast corner of Site G. Well G109 is located approximately 150 feet west of the former Waggoner surface impoundment (Site L). Well G110 is located downgradient of Site H. PCBs were detected at one time or another in Wells G101, G102, G104, G106, G107, G110, and G112. Of these, only G101 and G102 showed PCBs in all three sets of samples.

Inorganic analyses of samples from the IEPA monitoring wells indicate several parameters at concentrations above background (G108) and water quality standards. Standards for iron, manganese, and phosphorus were exceeded in samples from the background well. Barium, cadmium and lead were detected at concentrations exceeding standards in one or more well(s). In general, wells G109, G110, and G112 showed the most significant inorganic contamination. When compared with data for other wells, G109 contained very high concentrations of arsenic, copper, nickel, and zinc. The pH for G109

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			-	-	068	•	-	•	-	-	-	(chiarophone) (ppb)
		65	150	-	-	•	-	-	-	-	-	K Johen spens (pen)
OOSE												More entites (ppb)

TABLE 8-6: ANALYSIS OF GROUNDMATER SAWALES FROM THE TEPA HONITORING WELLS

SMOTE LOCATIONS

TABLE 8-8: AMALYSIS OF GNOWNMATER SAMPLES FROM THE TEPA MUNITIONING MELLS (COLLECTED 3-10-81 - 3-11-81)

SAMPLE LOCATIONS												
PARAMETERS	6101	6162	610)	6104	6106	6106	6107	6108	6109	6110	GIII	6115
Alkalialty	43	-	319	540	393	294	557	W	33	731	367	400~
Annonia	0. Z	●.●	1.6	0.0	0.4	3.0	0.2	0.0	15	0.0	0.1	0.
Arsonic	0.001		0.003	0.001	0.613	0.006	8.004	0.001	3.9	0.001	0.001	0.6
Serius	●.●	6.7	0.1	0.2	0.2	0.3	0.1	0.2	0. 1	0. L	0. l	0.
Boron j	0.2	6.4	0.3	6.7	0.3	0.5	0.5	0.2	0.5	0.1	0.4	3.
Cadalua	8.6	0.01	0.01	0.0	0.6	0.0	0.01	0.0	0.07	1.1	0.0	0.
Calcium	151	333	161	785	218	175	145	74	431	_151	74	207
100	10	24	47	9	23	146	47	12	930	10	9	52
thieride	16	124	46	26	57	150	235	51	24	21	16	133
Chromium (Total)	0.0	0.0	●.●	●.01	0.0	●. ●	8.0	0.0	0.01	0.0	0.0	0.
Copper	0.04	0.66	0.00	0.02	0.62	0.01	0.01	0.03	67	0.02	0.07	0.
yealde	0.0	8.8	0.0	8.81	8.8	8.8	0.0	8.8	6.6	0.0	0.0	
lardness	542	1062	620	839	796	675	1006	479	1651	424	485	189
irea	0.3	0.3	1.6	4.0	5.4	4.9	2.4	0.0	1.4	0.0	0.2	0
lead	0.0	●.●	●.●	0.	8.4	0.06	4.0	0.0	0.0	0.0	0.07	0
Regnes fun	34.2_	77.9	41.9	56 .8	47	44.8	44.8	22.3	J 30	28.7	31 8	- <u>12</u>
langanose	7.0	7.50	3.51	8.61	7.32	1.62	7.12	8.23	6.77	- B:34	1.02	7.
tercury	-	-	-	-	-	-	0.0002	-	0.0003	•	-	-
utcket	●.●	0.3	1.1	0.0	0.2	●.●	●.●	0.1	123	1.2	0.0	0
Hitrate-Mitrite	8.0	1.1	0.0	2.3	●.●	8.0	●.●	0.3	0.3	15	2.1	Ü
	6.9	6.8	6.8	6.9	6.4	6.7	6.7	7.0	4.6	6.6	6 8	6.
Phonolics	0.0	0.0	0.005	0.0	0.0	●.●	1.7	0.1	1.4	0.0	0 0	0
hosphorus	8.8	5.65	6.63	8.52	8.1	1.8	6.63	1.12	7.7	9.91	0.01	ð.
Petassium	4.0	10.6	10.4	5.9	8.9	5.7	2.0	10.2	6.4	6.3	2 9	40
ielanias	0.0	0.0	0.061	0.003	0.0	●. ●	0.0	0. 0 01	0.003	0.018	0 001	Ü.
Silver	0.01	0.62	0.0	0.0	0.42	0.61	0. OL	0.0	0.0	0.01	0 01	O.
ied ium	11	64	65.6	17.4	51.2	92.6	39.2	25.2	12.1	14.2	15.5	96
ulfale	118	617	471	761	465	146	313	55	2629	61	147	544
Ziac	0.1	0.0	2.8	0.1	0.3	●. 1	6.1	0. 3	6.3	1.6	0 1	11
PCB (ppb)	0.13	0.46	•	0.1	-	2.4	0.37	-	-	0.9		2.6

MOTE: All results in ppm unless otherwise moted.

Blanks indicate parameter met analyzed.

- indictes below detection limits.

TABLE 8-9: ANALYSIS OF RESIDENTIAL WELL AND SEEPAGE SAMPLES COLLECTED BY LEPA

SAMPLE DATES AND LOCATIONS

PARAMETERS	9/16/80 G501	9/16/80 G502	9/16/80 G503	9/23/80 G504	6/8/83 3505	1/5/8 x301
Arsenic	0.008	0.004	0.001		0.01	
Barium	0.2	0.16	0.39	0.05	0.4	1.1
	0.28	0.27	0.25	0.58	0.4	
Boron	0.20	0.27	0.25	0.30	0.4	0.3
Cadmium						
Chromium	0.00			0.00		
Copper	0.02			0.06	0.01	0.03
Iron	4.6	19	17.7	0.73	25	31
Lead						೦.ಡ
Magnesium	33	39	36	30	35.3	54
Manganese	1.02	1.26	0.79	0.65	1.3	1.49
Mercury				0.0001		
Nickel				0.02		0.1
Phosphorus				0.02	0.62	1.2
Potassium	6.6	5.7	4.5	6	6.2	6.4
Silver		•••		-	***	
Sodium	21	24	12	26	15.2	19
Zinc	0.85	• •	0.18	0.8		0.7
	0.03	_	J. 10	U. U		0.7
PCBs	•	•	•	_		0.13
Chlordane (ppb)	•					03

NOTE: All results in ppm unless otherwise noted Blanks indicate below detection limit

- Indicates parameter not analyzed Sample x301 was collected from basement seepage

TABLE 8-11: INDRGANIC ANALYSIS OF GROUND WATER AND SOIL SAMPLES IN THE VICINITY OF CREEK SECTOR 8 (COLLECTED BY MSEPA 3-3-82)

					SAIPLE L	OCAT 10HS				
PARAMETERS	SOL	Sez	203 Evon	MATER - 1	n PPB 505	S06	Sar	SOIL 11	9 PPM S011	A012
Alimiaus Ant lessy		-	30		745	1,700	755	185	430	4017
Arsenic	11			29			1.3	1.0		
Barius Beryllius							**	60	80	
Seren	10,500	11,000	8,000	1,800	140	110 2.5	1			
Cadalua	4.2	14	π	5.3		2.8	1.06	1.64	0.29	
Chronius	12						2.2			3.2
Cabalt	62 65	70	95	15			·			
Copper Iren	65,000	31,000	30,000	28,000	530	250	16 340	24	13	
Load	570	97	74	۵,۳	11	10		360	240	
Hanganese Harcury	1,505	1,100	1,566	3,105	445		(45) 126	(20) 630	137	
Hercury* Hickel Selenium	0.1	0.4	0.4	0.2	6.1		6.5	5.5	4	
Silver The Illum							 			
Tin Vanadium]						1		2	
Ziac	107,000	109.000	40,000	1,900	260	350	96	"	1 30	

[|] Blanks indicate below detection limits
() - Results did not must USEPA Quality Control criteria - Data unreliable

* Duplicate analysis performed by USEPA control regional laboratory
Samples 809 and 8012 are unter and soil blanks, respectively

A USEPA Field Investigation Team (FIT) contractor also performed an air monitoring survey in the creek bed in March, 1982. This survey involved the use of an organic vapor analyzer (OVA), an INU photoionizer, and Drager detector tubes for phosgene gas. indicated that a small, but measurable, concentration of organic vapors were present in the breathing zone (5 feet above ground surface), with concentrations increasing closer to the creek bed. In the breathing zone, the OVA showed readings up to 0.5 ppm above background, and the HNU readings were as high as 9 ppm above background. The survey crew also observed a 3-inch effluent pipeline adjacent to the former Waggoner Building which was discharging a small stream of oily liquid. OVA and HNU readings were taken approximately 6 inches from the surface where this liquid had pooled. The OVA showed concentrations up to 350 ppm, and the HNU showed concentrations ranging from 400 to 900 ppm in this area. Phosgene gas was not detected in any area using the Drager tubes.

HRS scores have been calculated on two separate occasions for Dead Creek. The creek was first scored in July, 1982, by Ecology & Environment, Inc., with a final migration score of 18.48. The site was again scored in March, 1985 by IEPA in an attempt to increase the previous score. IEPAs assessment led to a final score of 29.23, however, this score has not been finalized by USEPA. Route scores for the 1982 assessment were as follows: ground water 4.24, surface water 7.55, and air 30.77. Corresponding route scores in the 1985 assessment were 5.65, 10.07, and 49.23. Observed releases were used for all route scores in both the 1982 and the 1985 scoring packages. The only difference in the assessments was in the value assigned for waste quantity in the three routes. The 1982 package listed waste quantity as unknown (assigned value - 0), while IEPA calculated an approximate volume of waste based on sample results and visual observations.

A significant amount of data has been developed showing a wide range of contaminants in and around CS-8. Review of existing file data indicates numerous possible sources of contamination in the area.

sediment and subsurface soil samples from several locations in the creek bed and along the banks. The hydrology of the area has not been well-defined and should be addressed further. It has not been established whether the ground water discharges to Dead Creek or the creek acts as a recharge conduit for the Henry Formation aquifer. If discharge to the creek is occurring, the subsurface disposal areas (Sites H and I in particular) may be major contributors to the contamination of the creek.

Accordingly, existing IEPA monitoring wells on both sides of the creek should be redeveloped to allow for accurate water level measurements. This, in conjunction with detailed surveying of the creek bed and water levels in the creek, would allow adequate assessment of the hydrology in the area. This would be best-accomplished using continuous-recording water level instrumentation, and should be continued over a period of time sufficient to address seasonal fluctuations. In addition, records of industries in the area should be thoroughly reviewed to establish a profile of possible releases from each source.

Site Description

Creek Sectors C through F include the entire length of Dead Creek south of Judith Lane. This portion of the creek flows south-southwest through the Village of Cahokia prior to discharge into the Prairie DuPont floodway. The floodway subsequently discharges into the Cahokia Chute of the Mississippi River. The creek is somewhat wider through these sectors than in sectors A and B, and is not as heavily vegetated as Sector B. Creek Sectors C through F are delineated as follows: CS-C- Judith Lane to Cahokia Street, CS-D - Cahokia Street to Jerome Street, CS-E - Jerome Street to the intersection of State Route 3 and State Route 157, CS-F - intersection (as above) to the discharge point in the old Prairie DuPont Creek.

Site History and Previous Investigations

There are no known discharges to Dead Creek south of Judith Lane, although several apparent discharge pipes have been observed during preliminary reconnaissance. Site N of the Dead Creek Project is located immediately east of the creek in the southern portion of CS-C. Land use in the vicinity of Sectors C through F is residential/commercial for the most part. The creek flows underground through a culvert in the southern part of CS-E near Parks College. Although the Culvert under Judith Lane has reportedly been blocked, flow emanating from the culvert has been observed on several occasions.

IEPA collected five sediment and two surface water samples from creek Sectors C through F as part of their Preliminary Hydrogeological Study conducted in 1980. Locations of these samples are shown in Figure C-1, and analytical data is presented in Table C-1. The water samples showed very little evidence of contamination, although concentrations of copper exceeded the IEPA's water quality

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TABLE C-1: ANALYSIS OF SURFACE WATER AND SEDIMENT SAMPLES FROM CREEK SECTORS C THROUGH F (COLLECTED BY 1EPA 9-25-80)

				SAMPLE LOCA	ATIONS		
	Water			S	ed i m ent		
PARAMETERS	2301	5302	×101	x102	×103	x104	x105
Aluminum			12,000				
Arsenic	0.008	0.006	26				
Barium	0.12	0.08	1,300	4,700	210	390	475
Beryl ium	-	-	•	3	-	2	-
Boron	0.06	0.04	-	76	-	-	-
Cadmium	-	-	•	50	8	31	2
Calcium			24,000	5,300	210,000	16,000	13,000
Chronium	-	0.01	400	50	60	50	-
Cobalt		ŀ	40	32	6	8	9
Copper	0.26	0.04	15,000	17,200	320	1,800	360
Iron	0.66	0.87	57,000	110,000	11,000	19,000	18,000
Lead	•	-	800	1,300	260	250	75
Magnes ium	3	2	7,100	2,000	10,000	5,100	3,300
Manganese	0.03	0.12	600	170	210	160	200
Mercury		· ·	1.2				
Nickel	0.05	0.01	2,000	2,300	45	600	_
Phosphorus	0.19	0.2	·	6,200	720	1,200	4,200
Potassium	6.6	3.3	2,400	900	1,400	2,100	1,400
Silver	•	-	-	45	10		
Sodium	3	3	800	1,100	100	190	125
Strontium	0.08	0.07	100	140	210	47	43
Vanadium	-	-	•	50	22	31	35
Zinc	0.24	- l	12,000	21,000	900	5,600	780
PCB	-	-	0.12	0.12	2.8	2	-

NOTE: All results in ppm.
Blanks indicate parameter not analyzed.

- Indicates below detection limits.

proposed provided assumptions regarding chemical profiles are made. However, in order to accurately estimate waste quantities and define to what depth contamination has occurred, a more detailed sampling program is necessary. This would include developing a depth profile of chemical constituents in the creek bed. Cores should be taken from upstream and downstream locations, with additional sampling at point sources as necessary.

APPENDIX B

BORING LOGS AND MONITORING WELL DATA

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CEW 027288

		
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0.7 - Mg 3-430		
Mydraulie Conductivity 1.3 s 10 cm/sec		
Test Date 9-12-67		
stug fest 3eef gult	OUAE BUIL YRBY MAT	
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Seetle Mater 81ev. 396,86 Dece 3-26-87		
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Project NameDec	d Creek	Bering/Well No. EE-Glos
Project MeIL_3	3146	Location Site 4
Date Prepared		Owner :EPA
Propered by Kovi	in Phillips	Top of Inner Casing flow 407 21
_		oriting firm for dealing
Depth (ft)	Description	Driller Jerry Hammen
		Start & Completion Cates 1, 2, 87 1.1 4
		Type of Rig Mobile 8-61
E	E-G108	
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- 1 ,,,,,,,,,,,	E EEWW PILL	Screen Interval 24 - 29 ft.
		Seroon Type stainless steel 0.31" slot
- J.WWE		Stickup 0.53 ft.
7444		Well Type senitoring
- 1		Well Construction:
<u> </u>		Filter Fack 19 - 22 ft.
₩₩ #		Seal 22 - 25 ft.
10- MM		group 10 ft. to surface
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Preject Name Dead Creek Preject No. 15 3140		Bering/Well We. G-1
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Project No. IL 3140 Date Propered 1-12-87 Propered by Tim Maley		Swiet Ith
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_		Stilling firm for dealing
Depth (ft) De	ectiption	Driller Jerry Mannen
		Driller Jerry Mannen Start & Completion Dates 1/12. 1/12/8
G - 1		Type of Rig Mobile 8-61
G - 1		
		Method of Smilling _ 1 3/4" [.5.
0		hollow stem augers
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-	BROWN SILT	Hele Diam. 8 in.
-		Sering Depth 18.0 ft.
s 		Caasan and Sergen Diam
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		Commonts Subsurface soil samples
		from boring 0 - 10' and 10 - 20'
		analysed for MSL compounds.
		REWALL
		Ground elev. 407.31

Hering/Well No. G-2/EE-05 Location Sico d Dunce EPA Top of Inner Caing Elev. 411 35 Drilling Tim Fox drilling Drilling Tim Fox drilling Start & Completion Dates 1/14. 1/14.87 Type of Rig Mebile B-61 Method of Drilling 3 3, 4° 7.3. hellow stem augers		100. 356.69 Date 100. 100. 100. 100. 100. 100. 100. 100	No. of Samples 1 regard Types of Samples groundwater Types of Samples groundwater Samples 8 6 6 compounds Samples Amalyzed for 185, compounds	Split Samples Yes I 50 Recipiest Enviropect Comments Subjunctors sell tample from Dering 5 - 15' analyzed for HSL compounds. BROARES Slight organic oder
oject Name Dead Creek oject No. IL 1146 to Propored 1-14-07 opered by Tim Maley pth (Et) EE-05		TO SAND		•

Project Name	AR CLICK	Soring/Well Me. 3-3/EE-11
Project No. IL	1140	Location Site 3
Prepared by Thi	1-40-07	SWREE TEPA
Attended of Titl	- HETOY	Top of inner Casing Elev. 109 32
	•	Offiling Firm For drilling
Depth (ft)	Description	Stiller Jerry Manner
		Start & Completion Dates 1, 26-1, 26, 94
		Type of Rig Mobile 8-61
	EE-11	
		Method of Drilling 3 3/4" (.5.
	1 1	hollow stem sugers
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- 1 /////E		Hole Diem. \$ in.
- J WW		
-JWWME		Sering Depth 25 ft. Casing and Sereen Diam. 2 in.
-JMM*	## ## #	Screen Interval 18 - 23 ft.
IMM	# ## ###	Screen type stainless steel 0.01" slot
	## ####### FILL	Stickup 1.57 ft.
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TYYYF		Well Construction:
-TYYYYY		Filter Fack 23 - 16 ft.
		Seel 16 - 14 ft.
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- ALLIAN		Lock No
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15-37	GRAY SILTY	Static Mater Slev. 355.36 Date 3-11-87
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20-	FINE SAND	Breve to black
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		Date Sampled 3-24-67
		Samplers & & E
		Samples Analysed for MSL compounds
		Split Samples Yes I No
		Recipient Sverdrup, Inc. for Corre
		Copper
		Commonts <u>Subsurface soil samples</u>
		from bering 10' - 10' analyzed
	·	for MSL compounds.
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Project Name Dead Creek Project No. IL 3140	<u> </u>	Baring/Well No. 3-5
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Proposed by Tim Maley		Top of Inner Casing Elev. 4A
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		Start & Completion Dates 1,27 1,27.87
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Method of Detiling 1 1/4" ; p. no	}	
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BUTTTT IN MAIL MADE SURE		· · · ·
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CALUE CHAING RIAN AV		56-81-51 berequit esac
CALUE CHAING RIAN AV		51-12-12 Second 52-12-16
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(2,00), 1-H	.og (1ot/pairod	B-0318 400	3760 DOUG CEG
	\$6.1961.150.00	Blow Count	daged elgest
	Stem 62' block (steined) fine grain SAMD. (vet)	l.	6.50 - 10
	**************************************	+1-11-11	64 - 8.CA
	'enegy 99 0805	11-11-01	2.75 - 35
	.ovods so esst	91-51-01	05 - 5:01
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Sample Depth	Slew Count	Description	
1 - 2.5	3-3-4	0-1.5 FILL consisting of black cinders and small gravel. (dry) 1.5-2.5 FILL consisting of brownish cinders, slag, and medium grain sand. (dry)	
3.5 - 5	2-3-3	3.5-4 FILL - same as above. 4-5 FILL consisting of dark gray SILT. Soft and stained. Little of fine grain sand. (very moist)	
1 - 7.5	35-17-19	WASTE stool and a coal-like dense black flaky substance.	
1.5 - 10	2-3-3	MASTE - Wood and paper products, heavy black staining.	
11 - 12.5	3-3-5	MASTE - same as above.	
3.5 - 15	2-3-9	MASTE consisting of black (stained) silt, medium grain sand and wood. (wet)	
4 - 17.5	1-1-9	WASTE - Wood chips.	
.0.5 - 20	5-7-14	WASTE - came as above.	
11 - 22.5	9-10-13	MASTE - same as above.	
		MASTE discontinuos # approx. 23'.	
3.5 - 25	2-1-6	Firm brownish-gray fine-medium grain SAMD. Black staining throughout. Well-rounded and well served. Rounded to subangular. (vet)	
13.5 - 15	9-10-13	Dense gray fine-modium grain SAMD. Trace of course grain sand. Fairly well serted and rounded to subangular. (wet)	
	-	E.O.B. # 15	

Site Deed (Crook Sito-H	Sering/Well Be. H-3/well egg-02	
Sample Dopth Blow Count		Description	
1 ~ 2.5	6-10-13	0-2.5 FILL consisting of dense brown sandy CLAY including small gravel cinders, and brick fragments.	
3.5 - 5	2-3-4	Firm brown SILT and silty CLAY. Trace of fine grain sand. (metat).	
6 - 7.5	2-4-6	firm brown to yellowish brown very sandy SILT. Some fine grain sand and trace of silty clay. (moist)	
8.5 - 10	2-2-2	Same as above. (very meist)	

9-18-28 Very dense gray very silty fine grain SASD. Some silt. Wet.

Water table # apprex. 13 feet.

13.5 - 15

16 - 17.5

7-7-7

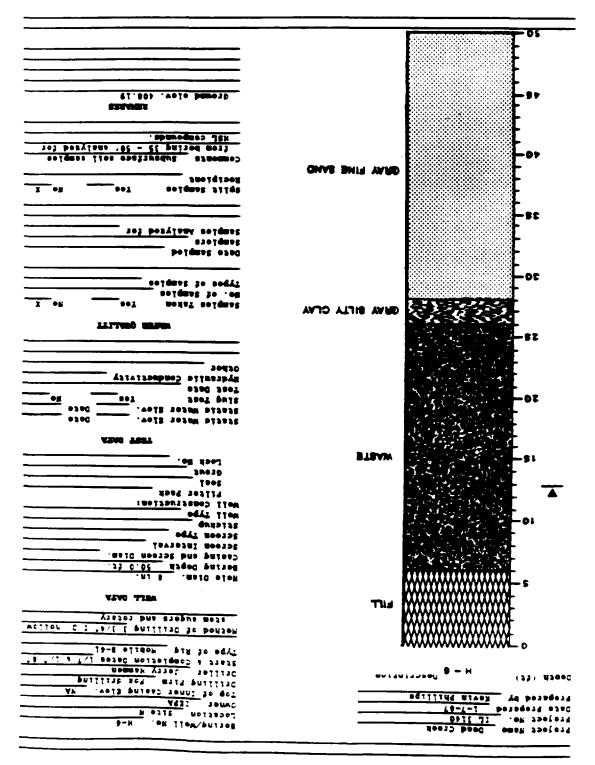
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Descript (← C	STOR COMPE	daged elgen
Fill commissing of black silty CLAT and cinders, brick fragments, and modium grain sand. Dry.	21-6-9	8.5 -
FILL consisting of black very sandy CLAE. Some sing and black staining.	1	6 - 6
6-7. Fill same as above, 1-7.5. Waste very heavy black oil or tar like staining (approximately) taches thick stains.		8.T -
5.5-9 FILL constating of brown silty CLAS. P-10 NASTE Slack (heavily stained) sludge-like meterial vith a trace of Licens. Very meist.		01 - S
. som . sphuls doald STRAD	1-1-1	8.51 -
Maria seas as above, including hard small apportest beads (1/8" dis.), and poper products. We with a visible oily shoom.		£1 - 6.
MATE same as above, including grammiar natorial and broken glass frag- mate. (Seme of the glass fragments appeared to have a threaded top suc is a sample jar). Not,	· [2.71 -
GATE same as above, including a greeniah-yellow jelly like material.	1	os - e.
Mara same sa ebeve, including a vhite granular material verned vith provedsheets, tagments, and burnt wood. Wet.	1	E.SS -
Mark consisting of multi-colored (red, green, brown, black, and white) sections including a chumb of a wary white substance that breaks into libebon.		es - e.
mate discontinuos & approx. 26". Vira brounish-gray tino grain thad. Some silt. You. Vory clayey &		£.75 -
1625.5'. Fory loose brown time grain same. Trace of medium to cearse grain sand. Fory well serted. Mat.	1-1-1	oc - e.

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.3no: 3-H	. on tlow/pulled	H-031E 400	25 9990 •315
	Describitor	Blow Count	drapte Depth
		l,	5 foot sample
	.eveds as enal	91-21-6	10.5
	deay vory dense time to ceates grain samb. Wet.	92-02-21	0) - 8.8C
.bester liew .Siis	Light gray vory dense fine grain SAMD. Trace of	82-22-61	\$\$ - \$*\$\$
	. eveds as east	10-79-73	05 - 5·81
	02 9 .6.0.3		

Dec 2 d 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Blow Court	daged elge
FILL consisting of black silty CLAT with crushed limestone and brick fragments. 3'.	91-11-21	£12 -
Stey stiff very silty CLAY. Trace of tine grain sand. Heist. Chemical	s-+-2	6 - 6
Seno se sheve. Seno black and dark gray staining. Geseline sdor.		2.T -
ione as above. We staining, Slight eder,	9-9-0	2 - 10
Prove and gray (mottled) them vory silty CLAF. Occasional silt string- sts. Noist. So oder.		2.51 -
ovodo so emoi	1	\$1 - \$·
brownish-gray loose tine grain shift. Some silk. Occasional iron stained pochets. Wet.	1	8.71 -
brown loose fine to medium grain shift. Trace of silt. Well seried and counded. Wet. Start sampling interval \$ 18'.	1	95 - 6.
loddish-brown donse coerse grain SAMD. Trace of small gravel. Some fin to modium grain sand. Poerly served and well reundod. Black stained		es - e.
iteyish-brown donso tine to medium grain SAND. Well rounded and serred.		0£ - €.
brown dones tine grain that. Trace of medium grain sand. Well served and reunded. Well served		8t - 8.
Brey vory dense fine grain SAMB. Occasional nature organic leyers.	1	0) - č.
Setural wood. (apparently drill and sample a buried tree 0 43')	70-52-30	es - e.
Stay fifth fine to coateo grain SAMD. Roundod, wet.		es - s.
.05 \$.8.0.3	; }	1

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*80 \$.6.0.3		
Pirm gray time to coerse grain SAMB. Wet. Well rounded.	6-6-E	\$C- 6.CE
From 37' dark gray time grain SAMO. Not. Slight chemical eder.	07-9-9	0E - 2.85
Some as above. (Fine grain sand in Tip of speed).	£-+−£	2.75 - as
Seme as above.	1-1-1	25 - 2.65
some on openor strangely possed (1×8) and strangely vertoes.	E-2-1	8.55 - 25
dray loose very clayer SILT, some fine grain sand. We bedding. Wet.	1-1-1	02 - 6.81
root trails or burrous.		
Same as above; bedding is 1/8" to 1/4" thich. Occasional fractures and	1-3-3	£-71 - 31
someally bodded and silefiely verved. Occasional fractures containing iron-like staining. Maist.		
dray fårm vory sandy ståry CLAE. Some fåne grata sand and ståt, Hort-	5-1-2	\$T - \$'ET
dray vory sandy SILT. Some time grain sand. Wee. Silght chemical eder.	1-1-1	8.51 - 11
Macor # 11, vaile drilling.		
MATE - no tocovery (ted bounced, probably tubber naterial).	2/00	01 - 5.8
(Seroe) SISTON		
Filth consisting of black and gray silty CLAS (possibly stained). I inches of black granular meterial and small sphorical boads () 7'.	11-21-0	8.4 - 9
.eveds as east 1117	1-6-9	\$ - 5·E
1.9-2.5 Brown and gray silty CLAT. Trace of small gravel, brick, and congrete frequence.	4-6-0	5-2 - 1
0-1.3 Sleck cinders		
##1367258eg	Blow Count	daqed elquet

		Betzgtz5eed	Sample Depth Blow Count
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	23.9 - 25	10.9 - 20	16 - 17.5	13.9 - 15	11 - 13.5	0.5 - 10	6 - 7.5	3.9 - 9	2.5	Sample Depth Blow Count
	7-14-11	1-1-1	¥ + 7	~	2-2-9	1-1-7		1	5-9-3	h Blow Coun
8.0.8. 0 25°	Brown medium grain SAND. Trace of coorse grain sand and small gravel.	Brown medium grain SAMD. Trace of coarse grain sand. Wet.	Brown fine grain same. Some medium grain cand. Wat.	Breve fine grain same. Wet.	Same as above; a 4 inch silty clay layer appears at 12°. Trace of fine grain sand.	Brown very fine grain Shift. Trace of silt. Dry.	Same as above: becomes increasingly stittler at 7' then grades into brown very fine SAMD at 7 1/4'. Trace of silt. Dry.	Stiff brown and gray (mettled) very silty CLAT. Trace of fine grain sand. Decasional clayey silt layers (2°). Heist.	0-2' Firm brownish-gray clayey SILT. Trace of fine grain sand. Hoist. 2-2.5' Firm brown eandy SILT. Some fine grain sand. Dry.	Description

Sample Dept	h Slow Coun	t Description
		Crushed limestone and gravel on surface - parking lot for semi-trailers
1 - 2.5	5-4-7	FILL consisting of brown-black sandy CLAY including a mixture of asphal fine to coarse grain sand, large gravel, and slag. Dry.
3.5 - 5	3-4-6	WASTE consisting of brown-black gravelly SAMD including slag, stained paper and wood products, and a white gravelly substance. Dry.
1 - 7.5	3-5-4	MASTE. Same as above; with more slag and small aphorical boads. Dry.
0.5 - 10	7-2-1	WASTE - poor recevery; probably same as above.
1 - 12.5	4-3-1	WASTE - same as above; wet.
3.5 - 15	7-10-14	WASTE consisting of black (oily stained) sludge-like material including wood chips, coarse grain sand, and concrete fragments. Wet.

WASTE. Same as above; with brick and concrete fragmouts, sand and

MASTE. Same as above. Fill material discontinues # 21'.

12-12.5 Deck gray silty CLAY. Moist.

Dork gray medium to course grain SASD. Wet.

Same as above; with a trace of small gravel. Wet.

Dark gray silty CLAY. Moist.

E.O.B. # 33.5"

21-22' Dark gray fine grain SAND. Some black staining. Wet.

Dork gray to black fine grain SAND. Trace of silt and medium grain SAND.

Boring/Well No. 1-1, Well + EZ-12

Site Deed Creek Site-[

4-3-1

0-0-2

2-1-2

0-0-1

6-6-10

21 - 22.5

23.5 - 25

26 - 27.5

28.5 - 30

11 - 12.5

3140 Dede Close 3149-1		Bering/Well No. 1-2
Sample Depth	Blow Count	Description
		Crushed limestone parking lot surface.
1 - 2.5	3-4-9	FILL consisting of black sandy CLAT including a mixture of fine-medium grain sand, asphalt, cinders, gravel, and slag. Dry.
1.5 - 5	1-1-2	FILL - same as above.
6 - 7.5	3-4-4	FILL consisting of black-brown silty CLAY. Trace of fine grain sand (in seams) # 7". Including some slag and wood particles. Dry.
6.5 - 10	3-2-2	MASTS consisting of light brown silty CLAY (to 9') including very loose black cinder natorial and medium grain sand. Dry.
11 - 12.5	51-11/1	MASTS - speem refusal - probably a large obstruction in fill material. Wet.
13.5 - 15	2-2-2	WASTE consisting of black only stained sludge-like natorial. Including fine to coarse grain sand, cinders, clay, and stained wood. Wet (with only shoom).
16 - 17.5	16-7-6	WASTE. Same as above; with more wood particles.
18.5 - 20	0-1-2	WASTE - poor recevery - probably same material.

Slack (stained) and gray SILT. Some very fine grain sand. Wet (with

dray fine grain SAND. Interbedding of finer silty sand and coarser sand

Grey fine grain SASD. Some black staining. Wet.

with small gravel: (approx. 4 inch layers). Wet.

21 - 22.5

23.5 - 25

26 - 27.5

28.5 - 10

31 - 32.5

33.5 - 35

7-8-10

4-6-8

1-3-2

9-7-3

elly shoon).

5-10-12 | Same as above.

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Project NameD	ad Creek	Bering/Well No. I-4/28-13
Project No. <u>IL</u>		Location Site :
Dete frepared		OWNER : EPA
Proposed byTil	Maley	Top of Inner Casing Blev. 409.16
		Drilling Firm Fox drilling
Depth (ft)	Description	Ortiler Jerry Hammon
		Start & Completion Dates 1,29.1,29.87
		Type of Rig Mebile 8-61
	EE - 13	
	••	Method of Orilling _ 1 3,4" 1.5.
		hollow stem augers
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0-111		WELL DATA
- 	# # # # # # # # # # # # # # # # # # # #	Rele Diam. # im.
	HI HHMMM FILL	Bering Depth 18.3 ft.
3 WW		Casing and Screen Diam. 2 in.
3		Seroon Interval 23 - 28 ft.
		Serven Type stainless steel 0.01' slot
, T(2)	BROWN	Stickup 0.52 ft.
	SILTY CLAY	Well Type
17	# # 25	Well Construction:
1000		Piltor Pack _18 - 10 ft.
4.4		3041 20 - 18 88.
10-	# ##	
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ا نے،		Static Water Slev. 398.75 Date 3-11-87
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1 1	BROWN AND	Test Date 5-12-67
3	GRAY FINE	Mydraulie Conductivity 1.1 a 10 ta/soc
]	SAND	Other <u>pff = 7.2</u> Cond. = 1888 unhes femp. = 56° f
1		Clear to yellowish
20-	St .533	42001 (4)(1)(4)(5)
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4 1		Samples Taken Yes X No
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25- F		Types of Samples groundwater
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		Date Sampled 3-23-67
28		Samplers _ E & E
		Samples Analysed for MSL compounds
	-	
		Split Samples Yes I Ho
		Recipient Sverdrup, Inc. for Corre
		Coffee
		Commonto
		186425

Project Name Dead Cr Project No. IL 3148 Date Prepared 1-30-4 Dead Creek Boring/Well No. I-5/EE-14 Location Site I Owner IEPA Date Prepared 1-10-87
Prepared by Tim Haley Top of inner Casing Elev. Orilling Firm Pou drilling Oriller Jerry Hamsen Start & Completion Dates 1/10 Depth (ft) Description Type of Rig __ Mobile 8-61 EE - 14 Method of Drilling 1 1/4" 1.3. hollow stem augers, Rotary WELL DATA Hele Diam. 8 in. Bering Depth 17.5 ft. Hele Diem. Casing and Seroon Diam. Screen Interval 12.5 - 17.5 ft Screen Type stainless steel 2.31
Stickup 1.36 ft.
Well Type somitoring
Well Construction: Pilter Pack 17.5 - 16 ft. Matural Seal 10 - 18 ft. Grout 18 ft. to surface FILL TRET DATA Static Water Slov. 397.23 Date 3-26-67 Static Water Slov. 398.55 Date 5-11-87 Slug Test Test Date Mydraulie Conductivity Other pd = 7.4

Cond. = 1466 unhee Temp. = 565 WASTE 20-Cloudy, yellewish WATER QUALITY Samples Takes No. of Samples No. of Samples 1 round
Types of Samples groundwater GRAY CLAY **₹** Date Sampled 1-3-23-47 Samples Analysed for MSL compounds 30 HWORE FINE - MED Split Samples Tes SAND Recipient Sverdrup, Inc. for Corre from bering 5' - 27.5 feet and
28.5 - 37.5 feet analysed for MSL Comments compounds. 2504253

Project Hame Dead Creek		Baring/Well No. 1-6
Project No. 16 1148		SOCIETION ZIZA I
Pate Prepared		Owner IZPA
transfer of Transfer		Top of Inner Casing Blev. MA
Depth (ft) Desc	F182168	Orilling Firm Fox drilling
		Oriller Jerry Hammen Stert & Completion Dates 2/2 4 2/2.6
		Type of Rig Mobile 8-61
I - 6		
		Method of Drilling 3 3/4" 1.0.
0 -30,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	rvf	hellow stem augers
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-1 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XII.	Barrag Break 15 (a)
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	**	Samples Taken Tes No_X
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	BROWN FINE SAND	Types of Samples
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	<u> </u>	samplers
		Samples Analysed for
		
		Split Samples(seil)Tes I Re
		Bocipiont Sverdrup, Inc. for Corre
		Compars Subsurface soil sample from boring 18 - 15' analysed for
		from boring 18 - 25' analyzed for
		ISE compounds.
		REFEREN
		Ground elev. 408.30

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		THE SAMO GRAY	OARR GRAY SANO.	A THE STATE OF THE	Project Mass Dead Creek Project Me. IL 3140 Date Propered 2-3-67 Propered by Tim Maley Depth (ft) Description EE-15
Split Samples Yes E Re- Resigions Sverdrup, Ind. for corre Copper Comments Subsurface sell ramples from bering 3.5 - 12.5 feet and 13.5 - 23.5 feet saniyand for MSL compounds.	Date Samples 1-13-07 Samples Abstract for 13th compounds		Piltor Poek 19 - 17 ft. Matural Soal 17 - 13 ft. Grout 17 ft. to surface Lock No. 1814 THE MATURAL THE MATURAL	Holo Dias. 0 in. Cosing and Seroes Dias. 2 in. Seroes Typo semisters steed 3.31" size Sticker 1.33 ft. Well Typo measurering	Bering/Well No. 1-7/22-15 Location 3100 I Owner 1EPA Top of Inner Casing Rlov. 106.41 Top of Inner Casing Rlov. 106.41 Top of Inner Casing Rlov. 106.41 Top of Inner Casing Rlov. 106.41 Top of Inner Casing Rlov. 106.41 Type of Rig Mebile B-61 Nethod of Drilling 1 1/4" I 3. Hethod of Drilling 1 1/4" I 3.

ligha well replaced to the control of the control o	######################################	Static water Blov. 197.00 Date 1-16-07 Static water Blov. 197.00 Date 1-16-07 Static water Blov. 197.00 Date 1-16-07 Short Date 9-13-07 Sydraulic Conductivity 1.4 z 10 cm/coor Other 20 m 1.6 m 7.6 Cond 1600 under 7-up 10 ° F Tollowish, slight oder Samples Taken Generati	100 groundvator 3-23-07 100 for 131, com	Comments
Project Name Dead Creek Project No. IL 1105 Propered by Fin Naley Depth (ft) Deacription				

Project HameD	ead Creek	Bering/Well Re
Project Me. IL	3140	Location Sito I
Date Propered	2-4-47	Owner 129A
Propored by 1	m Reley	Top of inner Casing Blev. 408.65
		Orilling Firm Fox drilling
Dopth (ft)	Description	Oriller Jerry Heamen
		Start & Completion Dates 2/4/87.2/4/83
	.	Type of Rig Mebile 8-61
	EE - 16	Method of Drilling 3 3/4° 1.0.
		hellow stem sugers. Rotary
	f i	
		WELL DATA
		Hele Diam. 4 im.
1,,,,,,		Sering Depth
1	######################################	Casing and Seroon Diam. 2 in. Seroon Interval 28 - 33 ft.
. 1	# #******	Serven Type stainless steel 0.31° slot
3 TWW		Stickup 1.74 ft.
1999	######################################	Well type mentering
1000	H HWW FILL	Well Construction:
111111	###### ****	Filter Fack 33 - 21 ft. Matural
1	Ⅲ Ⅲ	5001 21 - 19 ft.
▼ 10¬WW	######################################	Grout 19 ft. to surface
		Lock No
300		TRFF MGA
- 1		Static Water Slev. 397.27 Date 3-26-47
15-		Static Water Slev. 398.56 Date 5-11-67
		Slug Tost Tes So I
-	HI HIM WASTE	Tool bate
4		Bydroulie Conductivity
		Cood. = 1000 unhes feep. = 50° P
20-	,	Dark, cloudy, strong oder
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	餐 1 編 2	MATTER QUALITY
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4		Samples Taken Too I No
25-		No. of Samples 1 round
- 1		Types of Samples groundwater
	BLACK	
1 1	FINE SAND	Date Sampled
4	海 300	Samplers E & E
30-		Samples Analysed for MSL compounds
33-1		Split Samples Tee I Se
		Recipient Sverdrup, Inc. for Cotto
		C09901
		Commonts Subsystace soil samples
		from horize 6.3 - 22.5 feet and
		13.5 - 30' foot analyted for MSL
		compounds.
		2579,003

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odi, monaș	BROWN SILTY SAND	7 .	
Serson Interval		***************************************	₩
Casing and Seroon Blan.			W - s
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4044 A189			XX) -
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Hethed of Dettiing 33/4. : 5		• • •	
		01-1	
Type of Rig Hobile 8-61			
Start & Completion Deces 2/4 & 2/4/87		*****	
Detiling Firm Fox detiling Detilies Josey Hamson	W0136	Deectra	(23) #36+0
Top of Inner Cearne Elev. 44		Agrau a	- ia posedosa
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1 0315 40138307		17-7-6	- of 350(014
Seting/Well No. 1-10		20022 DV00	750 014
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Project Nese De Project No. IL	end Creek	Sering/Well No. [-11
Project No IL	3140	rocectou 3169 [
Date Propered	2-3-67	JWhor IPA
Proposed by Til	<u>B Maley</u>	top of inner Casing Elev. MA
		ocilling firm for deilling
Depth (ft)	Description	Stiller Serry Hammon
		Start & Completion Dates 1/5 & 2,5/87
		Type of Rig Mobile 8-61
	1 - 11	
	, ,,	Method of Orilling 1 1/4" [.D.
_		hollow stem augers. Rotary
ער אינור אינ	iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	
ענונונד -		WELL DATA
- ₹XXXXX		
-1XXXXX		Hele Diam. 8 in.
-4XXXXX		Boring Depth 18.5 ft.
XXXXXX		
• 7()()()	XXXXXXXXXXXXXII FILL	Screen Interval
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	000000000000000	Filter Fack
		Grout To
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- 12.5		TRET DATA
15-020		
370	WASTE	Static Water Slev Date
	THE WASTE	Static Water Elev. Date
353.77		Slug Tost Tos No
1/21		Tost Date
- 111.51		Hydraulie Conductivity
20-37		Other
-23-20		
٠٠ . ت. ا		
	7 x 2 x 3 x 3 x 3	
HG3226BB316	GRAY SILTY CLAY	ANTER CONTILL
28-		Samples Taken Yes No_X
		No. of Samples
-		13800 ot 20mbres
30-		Date despled
	BROWN AND DARK	34001071
		Samplers Samples Analysed for
	initial and the second	
-//	CRAY FINE SAND	
***************************************		Solit Samples(seil)Tes I No
36-		
		Recipient Sverdrup, Inc. for Corre
		Capper
		Commonts Subsurface soil samples
38.5 This		from boring 6 - 20' 6 26 - 18.5
		analysed for MSL compounds.
		PERMITS
		Ground elev. 405.88
		4.4444 4.44. 444.44
		

site <u>Seed C</u>	rook Sito-I		Sering/Well So. :- [:-[] ::ont
ample Dept	Blew Coun	·	Description
1.5 - 15	; j	5480 48 4B0V0.	
7 - 30.5	8-17-16	Same as above.	
		E.a.B. # 18.5*	

CFR 051635

9E9TS0 ¥32	9	£9	T	5	0	N:	30
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DE-230 | 10m/21-1 -on 11om/paison

E.O.B. @ 28.	1	1
tame as above. Trace of small gravel. Meg.	02-77-6	2.75 - as
Brown medium grain SAMB. Wee. Trace of coerse grain sand \$ 24-25".	11-7-4	25 - 2.55
tame as above.	11-6-6	8.55 - 15
time to above.	6-6-t	02 - 6.01
.ovods sa ebove.	p-t-1	8.71 - 31
.30M .eveds as emak	(-1-13	81 - 8.61
1.5.51 % Saider . ovode as omet	9-6-6	6.51 - 11
tame as above.	9-6-6	01 - 5'8
Brown tine to sectium grein SAMD. Dry.	3-1-6	8.7 - 3
.eveds as email	1-1-1	6 - 8·t
Brown stilly CLAT. Dry.	1-1-1	8.5 - 1
Detr brown sendy clay topsell on surface.		

375- Deed Creek Stre-I

te <u>2066 (</u> 1	reek lite	Bering/Well Bo. 1-L
ple Depth	Blev Com	Description
		Slack foundry SAMD on surface.
2.5	4-4-8	FILL consisting of black-dark brown-rust colored medium grain SAND. Trace of crushed limestone and brick fragments.
- 5	2-5-4	Foundry sand FILL to 4'. Them: Gray suity CLAF. Slightly mettled. Trace of fine grain sand.
7.5	2-2-4	Same as above.
- 10	3-3-4	Same as above. Siltier 0 10'.
- 12.5	3-4-6	Light brown silty SAMD. Seconds sandy SILT at 12'.
5 - 15	2-4-5	Brown sandy SILT. Wet.
- 17.5	3-5-6	Same at above.
5 - 20	2-2-3	Dork gray sandy STLT. Some fine grain sand. Wet.
		E.O.B. 0 20'

18.0.8 g 18.0.8	Ì	
.Joh .evods 20 onst	PT-6->	es - e.cs
desciine eder.		
dray modium to coarso graim SAMB. Trace of small gravel. Wet.	6-1-1	8.55 - 15
Seme as above. Verved # 19	r-1-1	05 - 6.61
Seme as above.	t-t-t	8.71 - 91
.20M .ovods so entl	1-4-6	61 - 6·61
deny fine grein sandy Sill. Wet 8 13.	1-3-3	8.51 - 11
Some an above. Silition and trace of small gravel # 18".	1-1-4	01 - 6.6
desy silty CLAY. Slightly sectiod. Trace of time grain sand.	1-1-1	2.7 - 3
.'' ansigga & sountinossib iii . ovods as onel	4-9-5	8 - 8.E
crushed limestene fragments.		
Fill consisting of black-dark gray sandy CLAY. Some foundry send and	15-8-8	\$ · z - t
Black foundity sand on surface.		
De 13d 1398eg	Blow Count	daged elgest
5-; Jei Ilen/Petind	L-0312 #00	2750 DOOG CEG

Site <u>Dead C</u>	200# 2160-7	Sering/Well So. 2-1
Sample Dept	h Blow Cour	Description
		Foundry sand on surface.
1 - 2.5	4-5-6	PILL consisting of black-dark brown sandy CLAY. Trace of modium grain sand (foundry) and brick fragments.
3.5 - 5	6-9-14	Same as above. Auger refusal at 5'. Large obstruction encountered. Noved bering 6' north. Continue sampling.
6 - 7.5	2-2-3	FILL consisting of black-dark brown sandy CLAY. Trace of medium grain foundry sand and slag material. Loose and dry # 18'.
0.5 - 10	3-3-3	Same as above.
11 - 12.5	2-2-1	Same as above. Moist.
13.5 - 15	1-2-3	Same as above. Wet.
16 - 17.5	1-2-4	Same as above. Fill discontinues # approx. 18'.
18.5 - 20	2-5-7	Brown-gray modium graim SAND. Wet.
23.5 - 25	4-7-19	Same as above. Increased course grain sand.
		8 0 8 . 4 25'

*67 0 .E.O.R	}	1
	1	
.ovoda as enal	\$-5-5	02 - \$181
(90.016 00000 00 00000 00000 00000 00000 00000 0000		
Gray-brown modium to coerse grain 1680. Trace of small gravel. Not.	3-1-4	6.71 - 91
desy-brown modium grain Samb. Mot.	1-6-8	61 - 6·61
cisy isyes as 13' (-3.5").	1	}
dray-brown modium grain SAMD. Mot. Some black staining # 11'. Thin	6-9-[6.51 - 11
Some as above. Slightly stained. Fill discontinues & apprex. 10.5%	9050	01 - 5'8
A A	3-1-6	
Same as above.	1-2-1	8.7 - a
Same as above. Mozat.	1-2-2	6 - 6.0
brich fregments. Trace of medium grain sand and smell gravel.		
FILL constating of dark brown saley CLAT. With crushed limestone and	11-11-01	5.5 - 1

3750 Deed Creek 3550-K

Describeres

Site Dead C	rook Site-R	Bering/Well No. K-2
Sample Dept	h Blow Count	Description
1 - 2.5	10-11-25	fill consisting of brown-gray-black sandy CLAY with crushed limestone gravel, and brick fragments. Moist.
3.5 - 5	3-4-5	Same as above.
6 - 7.5	1-2-3	Same as above. Silty and soft.
8.5 - 10	2-2-1	Same as above. Trace of medium grain sand and small gravel. Very moust.
11 - 12.5	3-3-4	Same as above. Trace of wood chips. Wet. Fill discontinues 0 approx. 13'.
13.5 - 15	1-6-6	Firm dark gray-gray very fine grain SAED. Well rounded and well served. Slack streaking # 13 $3/4^{\circ}$ (-2°). Wet.
16 - 17.5	2-4-4	Same as above. Setural black staining.
18.5 - 20	10-11-14	Same as above. Cleager. Wet.
		8.0.8. # 20'

site <u>Deed C</u>	rook Sito-I	Sering/Sell No. K-1	
Jemple Dept	p stea com	Description	
2.5	5-7-12	FILL consisting of brown-black silty CLAY. Some small gravel and trushed limestone fragments.	
3.5 - 5	6-7-9	FILL consisting of black sandy CLAY with small gravel, stag material.	
5 - 7.5	1-1-1	FILL consisting of black clayer SASD. Trace of small gravel. Wet.	
8.5 - 10	1-2-1	Same as above.	
11 - 12.5	1-2-2	No recevery.	
13.5 - 15	4-10-5	FILL consisting of soft black silty CLAY. Trace of fine to medium grain sand, small gravel, and limestone fragments. Wet.	
i		Fill discontinues # appres. 16.5'.	
6 - 17.5	2-3-6	Gray sandy CLAS. Very seist.	
6.5 - 20	1-3-4	Brown-gray fine grain SAMD. Wet.	
		E.O.S. # 38*	

te <u>Deed C</u>	reek \$1te-	Sering/Sell No. U-1
mple Dept	h Blow Com	Description
. 2.5	4-6-7	$\frac{0-2}{2}$ FILL consisting of black sandy clay with asphalt, minders, and gravel.
		Fill discontinues # approx. 2'.
		2-2.5 Brown silty CLAT. Some small gravel. Moist.
- 5	4-4-3	Brown clayey SILT. Little fine grain sand. Meist.
7.5	3-3-6	Same as above.
- 10	2-2-2	Same as above. Very meist.
- 12.5	3-1-1	Soft gray clayey SILT. Little fine grain sand. Wet.
5 - 15	1-1-1	Soft brownish-gray very silty CLAY. Trace of fine grain sand. Occasional thin seems of gray clayoy silt. Moist.
- 17.5	VOR	Loose gray fine grain SAND. Wet.
5 - 20	5-5-7	Same as above. Wot.
		8.o.s. # 20'

Site <u>Dead C</u> i	reek Site-L	Sering/Well No. L-2			
Sample Depti	Blow Coun	t Description			
		2-1 Fill on surface - black cinders.			
1 - 2.5	4-12-60	FILL consisting of black sulty CLAY. Trace of small gravel and concrete fragments. Helat.			
3.5 - 5	8-5-7	FILL consisting of hard dark gray silty CLAY. Trace of small gravel. brick fragmonts, and wood chips.			
6 - 7.5	2-4-6	FILL consisting of black-gray silty CLAY. Trace of small gravel and wood chips. Very moist. Stained black.			
		Fill discontinues # 8'.			
8.5 - 10	2-2-3	Soft gray very easily SILT. Some fine grain sand. Very meist. Black staining throughout.			
11 - 12.5	6-7-14	Same as above.			
13.5 - 15	4-8-9	Loose black sandy SILT. Some fine grain sand. Very moist.			
16 - 17.5	2-2-3	Loose black fine grain SAND. Wet.			
18.5 - 20	2-1-4	Same as above. Trace of silt. Wet.			

Site	Deed C	load Crook Site-L Soring/Well Ro. L-3		
51.00	Le Depti	Blow Cour	Description .	
			2-1 Black cinders FILL	
1 -	2.5	6-7-9	FILL consisting of stiff brown-gray silty CLAY. Trace of fine grain sand, small gravel, and brick fragments. Moist.	
3 . 5	- 5	5-5-6	PILL consisting of stiff gray silty CLAY. Little small gravel; trace of fine grain sand, large gravel, brick fragments, and wood chips. Moist.	
			Fill apparently discontinuos # appros. 6'.	
6 -	7.5	2-2-3	6-6.3 Loose dark gray SILT. Stained black. 6.9-7.5 Loose brownish gray very sandy SILT. Seme fine grain sand. Noist.	
a.s	- 10	3-4-6	Firm, gray clayer SILT. Some brownish staining. Trace of fine grain sand. Moist. Mettled.	
11 -	12.5	1-1-5	Firm black clayey SILT. Some clay. Little fine grain sand. Very coust.	
13.9	- 15	3-3-5	Firm black-gray sandy SILT. Some fine grain sand. Little clay. Moist.	
16 -	17.5	2-5-10	16-17 Sado as above. Wet. 17-17.5 Slack silty SAMD. Wet.	
18.5	- 20	1-2-4	Firm black fine grain SAND. Well serted. Wet.	

Boring/Well Re. <u>L-4/Well 9 E8-Gil9</u> ISPA Replacement Well

Sample Depth	Blow Count	Description			
	i	3-1' FILL consisting of black aspnalt and clay.			
1 - 2.5	5-6-7	from 2' Brown sandy SILT. Houst.			
3.5 - 5	3-3-4	Brown sandy SILT. Trace of medium grain sand.			
6 - 7.5	3-4-4	6.3-7 Brown silty CLAY. Trace of fine grain sand. 7-7.3 Gray fine grain SAND. Trace of silt and clay.			
6.5 - 10	3-4-6	Brown-gray (mottled) clayey SIGT. Trace of fine grain sand. Moist.			
11 - 12.5	4-7-8	Gray sandy SILT. Wet.			
13.5 - 15	6-11-13	Same as above. Trace of fine grain sand.			
16 - 17.5	8-14-34	Stiff groy sandy SILT. This laminated black-gray layering.			
18.5 - 20	0-13-15	Gray fine grain SAMD. Wet.			
21 - 22.5	9-12-17	Same as above.			
23.5 - 25	7-14-18	Dark gray fine to coarse grain SAND. Some black staining. Wet.			
		8.0.8. # 25'			

8.0 .	18.5 - 20 2-3-7 Pirm	16 - 17.5 2-5-7 Pire	13.5 - 15 1-3-3 5400	11 - 12.5 1-2-5 Lees	0.5 - 10 2-4-7 Lees	6 - 7.5 2-4-3 <u>6-7</u> u reddin 7-7.5 staini	1.5 - 5 1-9-9 1.5-4	7	1 - 2.5 4-6-10 9-2.5 9rean	Sample Depth Blow Count	Sire Dead Creek Sire-M
R.O.B. @ 20'	Pirm gray fime grain sAND. Wet.	Firm gray silty fime grain SASD. Trace of small to modium gravel. wet.	Same as altere.	Lacco brown very cilty fine grain shift. Some milt. Black stained layer at 13' (-1")	Loose gray sandy SILT. Some fine grain sand. Trace of organic material (weed, etc.). Stained black. Wee.	6-7 Loose gray very sandy SILT. Some fine grain sand. Black and reddish staining throughout. Wet. 7-7.5 Loose brownish gray fine to medium grain SAND. Some reddish staining. Wet.	3.5-4 Stiff gray very sandy SILT. Seme fine grain sand. Wet.	Pill discentinues @ 3".	9-2.5 FILL consisting of crushed limestone, gravel, and fine to coarse grain sand. Net.	Description	Becing/Well No. 4-1

Site <u>Deed Ci</u>	ook Site-#	Sociag/Mell Bo. N-2
Sample Depti	Blow Count	Description
		2-1 Crushed limestone fill
1 - 2.5	9-10-12	1-2 Cruehod lime fill 2-2.5 FILL consisting of loose dark gray very sandy SILT. Some fine grain sand. Trace of organic material (weed a roots).
3.5 - 5	R	No recevery - possible cubber tire
6 - 7.5	T T	No recevery - possible concrete
8.5 - 10	47-4-2	FILL consisting of dark gray silty clay with concrete material and gravel. Fill discontinues 0 approx. 10'.
11 - 12.5	6-10-9	Firm dark gray very sandy SILT. Sees very fine grain sand. Trace of organic material (wood and roots). Black streaks. Wet.
13.5 - 15	3-4-4	Firm gray fine to medium grain SASD. Frace of small to medium gravel. Wet. Sand is rounded to sub angular and fairly well to peoply served.
16 - 17.5	7-11-12	Gray fine to medium grain SAND. Trace of small gravel. Wet.
18.5 - 20	8-12-14	Deage brown fine to medium grain SAND. Well serted. Wet.
21 - 22.5	9-13-15	Same as above.
23.5 - 25	9-11-15	Donne gray fine to medium SAND. Trace of course grain sand and small gravel. Wet.
26 - 27.5	8-12-13	Donne gray fine to course grain SAND. Trace of small gravel. Wet.
20.5 - 30	9-14-23	Same as above.
11 - 32.5	7-9-11	Dease gray very fine grain SAND. Wet.
33.5 - 39	4-4-10	Same as above. Derker gray.
16 - 37.5	12-17-23	Very domae. Gray fine to course grain SAMD. Wet.
16.5 - 40	8-9-12	Same as above.
		8.0.8. # 40°

Bottag/Well Bo. 0-1/Well 922-71

Site Deed Creek Site-O

Sample Depth	Blow Count	Description		
		Well vegetated clay cap.		
1 - 2.5	2-4-8	FILL consisting of brown silty CLAY. Trace of very fine grain sand.		
3.5 - 5	3-5-6	Same as above.		
6 - 7.5	2-2-2	Soft black silty CLAY. Slack sponge-like substance # 7.5' (.5')		
İ		Fill discontinuos # approx. 8'.		
0.5 - 10	3-5-7	Srown sandy SILT. Trace of fine grain sand. Dry.		
11 - 12.5	3-5-7	Srown fine grain SARD. Dry.		
13.5 - 15	1-1-1	Soft brown-gray silty CLAT. Trace of very fine grain sand. Meist.		
16 - 17.5	3-4-6	Brown very fine grain SAND. Dry.		
18.5 - 20	2-3-3	Brown-gray silty CLAT: mottled. Trace of very fine grain sand. Moist.		
21 - 22.5	1-1-4	Gray fine grain SAMD. Wet.		
23.5 - 25	7-19-25	Same as above.		
26 - 27.5	6-9-29	Same as above.		
28.5 - 30	5-10-11	Same as above.		
33.5 - 15	6-8-12	Same as above: cily sheen # 14'		
		E.O.S. # 35'		

Site Dead C	reek Site-	Sering/Sell Se. 2-3
Sample Dept	p Bloa Com	Description Description
	i	Well vegetated clay cap.
1 - 2	5-5-7	FILL consisting of dense brown silty CLAY. Trace of very fine grain sand.
1.5 - 5	2-1-2	Same an above.
6 - 7.5	1-2-2	Same to 6.5' 6.5-6' Black sponge-like substance. Sludge. Fill discontinues # approx. 8'.
6.5 - 10	1-4-7	Brown very fine grain SAND. Trace of silt. Dry.
11 - 12.5	3-2-3	Same as above.
13.5 - 15	3-2-3	Brown silty CLAF. Trace of very fine grain sand. Slightly mettled. Heist.
16 - 17.5	3-5-6	Brown silty very fine grain SASD. Dry.
10.5 - 20	7-7-7	Brown very fine grain SAND. Wet # 20'.
		8.o.9. 0 20'

Site <u>Dead C</u>	reek Site-	Dering/Mell De. 2-4	
Sample Dept	h Blow Com	Description	
		Well vegetated clay cap.	
1 - 2.5	1-2-2	FILL consisting of donse brown silty CLAY. Trace of fine grain sand.	
3.5 - 5	6-3-4	Same as above to 4'. 4-5.3' Black clay-like sludge.	
6 - 7.5	1-3-4	Dark greenish-gray very fine grain SAND. Trace of silt. Dry.	
0.5 - 10	4-6-8	Dark brown very fine grain SASD. Trace of clay and silt in this layers.	
11 - 12.5	4-4-5	Light brown fine to medium grain SAND. Dry.	
13.5 - 15	3-4-5	Brown very fine grain SASD. Proce of silt. Dry.	
16 - 17.5	1-3-4	Scoun-gray silty CLAY. Trace of very fine grain send. Dry. Soft black silty clay layer # 17 1/4' (-2")	
18.5 - 20	6-6-7	dray very fine grain SASO. Trace of silt and medium grain sand. Wet 8 20'.	
		E.O.B. 0 20'	

Site Dead C	reek Site-	Sering/Well No. 2-5
Sample Depth Blow Count Description		
		Well Vegetated clay cap.
1 - 2.5	1-2-2	FILL consisting of soft brown silty CLAY.
3.5 - 5	1-1-1	Same as above. Pill discontinues 0 apprex. 5.5'.
6 - 7.5	4-4-4	Srown very fine grain SAND. Seme silt. Dry.
8.5 - 10	2-5-7	Brown fine grain SAND.
11 - 12.5	3-4-3	Seme as abeve.
13.5 - 15	2-3-4	Brown-gray silty CLAT. Some interhodding of silty very fine grain send. Dry.
16 - 17.5	2-2-3	Gray very fine grain SAND. Trace of silt. Moist # 17'.
18.5 - 20	3-4-4	Same as above. Wet.
		2.0.3. 0 20°

11-1-2 8C - 8.EE	'eneda aa emak
6-9-9 OC - 6.05	. 100 to the the cont.
91-8-9 5.75 - 35	dray fine to medium grain skare. Trace of small gravel. Mec.
01-t-) 25 - 2.55	.eveds sa shore.
i i	
	.300
\$1-E-8 8.55 - IS	Stewn medium grain SAMD. Trace of coarse grain sand and small gravel.
91-9-2 92 - 5'91	Brown fine to medium grain SAMB. Net.
	clay layers (-1") @ 16 3/4".
8-71 - 31	Brown vory fine grain same. Trace of silt. Not. Two thin gray silty
E-1-1 61 - 6'E1	Stown tine to medium grain shift. Wet.
t-1-1 6'E1 - 11	Soft gray silty CLAX. Trace of very fine grain sand. Neige.
1 1	
8-2-1 01 - 5-8	Same as above. Brown-gray silty CLAX layer # 8.5-9'.
5-E-5 8.7 - a	Same as above. Increased amount of sallt.
1-7-7 6 - 6 - 6	2480 48 45040.

Brown very time grain SAMD. Trace of silk. Ory.

STED DOOD CLOOK STED-O

Settag/Well Bo. 0-6/Well (EE-1)

·cc + .e.o.s		
dray modium grain Shift. Noc.	AR.	0C - 2.0S
.eveds as email	6-1-9	2.75 - DE
small gravel. Wee.		
Brown medium grain SAMD. Trace of clay \$ 26'. Trace of cearse sand and	17-72-53	25 - 2.ES
Stove very fine grein SAMD. Trace of silt. Net.	61-4-6	8.55 - 25
State as above.	1-2-2	DE - 6'8T
gravel. Wee.		
stons and Lags and base atest stees of rectine of the man and said and and and and and and and and and an	01-0-6	8.71 - 91
Gray very fine grain SAMB. Yery maint.	6-4-9	\$T - \$'ET
Brown-silty CLAS. Slightly mottled. Trace of time grain sand. House.	0-2-0	6'21 - 11
Brown fine to medium grain SAND. Dry.	r-r-a	01 - 6.0
dray very time grain slame, sees sile, Dry.	>->- >	8.7 - 3
Broumish-gray fine grain SAMD. Trace of silt. Dry.	11-6-9	£ - £.E
.'[discomzinues #]'.		
tine to ceerse gream send, and salt.		
FILL consisting of black silty CLAY. Some crushed limestone, gravel.	22-22-62	5.5 - 1
Well vegetated clay cap.		

temple Depth Blew Count

9760 Deed Creek \$160-0

Describine

Settag wall so. 0-7/well egg-14

Site Dead Cr	eek Site-O	
Sample Depth	Blew Count	Description
		Crushed limestone surface.
		* Straight drill to 23.5 Approximate stratigraphy based on auger cuttings.
		0.5'-1.0' Block cilty CLAY. Fill.
		1.0-20+' Brown fine grain SASO. Trace of silt. Water level while drilling ~19'.
21.5 - 25	11-16-15	Brown fine to medium grain SAMD. Wet.
28.5 - 30	9-17-17	Srown-gray fine to medium SASD. Wet.
13.5 - 15	5-4-13	Brown modium grain SASD. Trace of coarse grain sand and small to modium gravel.
		# A # A 18/

Site Dead C	reek Site-	Sering/Well So. 3-9
Sample Dept	h Blow Cou	nt Description
	Hand	3-1 Red-brown silty CLAY (fill-cap material).
1 - 2.5	Kand auger	FILL consisting of red-brown mettled silty CLAY. Trace of fine grain sand and reets. Meist.
1.5 - 5	Hand	3.5-4' FILL condisting of grayish-brown silty CLAY. Trace of fine grain SAND. Trace of black hardened material throughout.
		Fill discontinuos # 4'.
		4-5' Brownish-gray very silty fine grain SAMD. Some silt. Moist.
6 - 7.5	Hand auget	Loose grayish-brown very silty fine grain SASD. This reddish or black- gray staining in herisental .yers.
8.5 - 10	Rand auger	Firm grayish-brown very silty fine grain SAMD. Similiar stain as seen in sample above. Very maint. Oily shoom.
11 - 12.5	Rend Augor	Grayish-brown sandy silty CLAY. Some silt. Little fine grain sand. Oily shoon in very moist layers.
13.5 - 15	Rend	Brown very sandy SILT. Some fine grain sand. 2" fine grain sand layer # 14.5" stained red-orange. Black-gray stained layers throughout.
16 - 17.5	Hand auget	Brown very silty fine grain SAND. Wet.
10.5 - 20	Read -	Same as above. Cily sheem in water.
	1	R.O.S. 6 301

Site Dead Cr	eek Site-o	Cortag/Well So. 3-13
Sample Depth	Slow Count	Description
3 - 1	Hand auger	FILL consisting of red-brown sandy silty CLAY
1 - 3.5	Kend auger	FILL consisting of black cinder-like material. Dry.
3.5 - 5	Hand auget	FILL consisting of black cinders. Dry.
5 - 7	Hand auget	FILL consisting of black to groomish-black sludge-like material and soft silty clay. Wet.
-		Fill discontinues @ 7'.
7 - 0.5	Hend auget	Greenish-gray fine grain SASD. Black staining throughout. Wet.
8.5 - 10	Hand auges	Greenish-gray very sandy SILT. Black staining. Very moist.
10 - 14	Head auget	Light brown fine to medium grain SAMD. Heist. We apparent staining.
		E.O.S. # 14"

Site Dead	Creek Site-	Boring/Well Se. P-1
Sample Dep	th Blow Cour	t Description
		Crushed limestone on surface.
1 - 2.5	4~3-3	FILL consisting of black sandy CLAY with crushed limestone, sing gravel, coal, and cinders.
1.5 - 5	4~3~3	Same as above.
6 - 7.5	5-7-25/3	PTLL consisting of various debris including paper and plastic products. slag gravel, asphalt, and silty clay. Large obstruction encountered # 7.5'.
8.5 - 10	6-12-10	FILL consisting of brown silty CLAT with various debris including paper products, small gravel, and fine to coarse grain sand. Not.
11 - 12.5	6-17-3	Same as above.
	İ	FILL discontinuos # 13.5'
13.5 - 15	3-6-7	Dork brown-dark gray silty CLAF. Slightly mottled. Trace of very fine grain sand. Dry.
16 - 17.5	2-4-4	Same as above to 17'. 4" layer of gray fine grain sand # 17-17 1/3'. Dry. Then dark gray SILT. Trace of very fine grain sand. Dry.
18.5 - 20	1-9-4	Dark gray very fine grain SASD. Trace of silt. 2° gray silty clay layer # 19°. Then light gray fine to medium grain SASD. Dry.
21 - 22.5	6-10-13	Srown medium grain SAMS. Trace of course grain sand and small gravel. Day.
23.5 - 25	6-13-12	Same as above.
28.5 - 30	2-9-7	Same as above.
33.5 - 35	1-5-10	Same as above. Wet.
		8.0.8. # 35'.

Sample Depth Blow Count Site Deed Creek Site-P Beting/mell Be. Description 1

	38.5 - 40	11.5 - 15	20.9 - 30		26 - 27.5	23.5 - 25	21 - 22.5	10.5 - 20	16 - 17.5	13.5 - 15	11 - 12.9	8.5 - 10	6 - 7.5	3.9 - 5) 1 22 13	
	7-13-14	7-11-10	6-9-12		j. † ;	10-4-28	6 - 30/3	:	4-3-14	7-7-8	9-9-7	2-4-4	3-4-4	3-3-7	6-6-7	
#.O.B. • 40°.	Desce brown fine to medium SAMD. Wet.	Brown medium grain same. Wet.	Dark gray fine to medium grain sage. Melet.	FILL apparently discontinues 0 18'.	He recevery. Probably same as above.	Same as above. Peer recevery.	Jame es above. Speem refusal.	3400 44 above.	Jame as abeve. Meist.	Jame as above.	Same as above.	W 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	900000000000000000000000000000000000000	Same on above.	PILL consisting of black-brown sandy CLAY with versue debris including paper and plastic products, weed chips, slag, small gravel. fine to coarse grain sands, and brick fragments. Dry.	Crushed Limestone on surface.

4-10-1 SEED AS ADOVE.	23.5 - 25 3-3-5 6480 as above. Moist.	3.5 - 5 6 - 7.5 6 - 7.5 6 - 7.5 6 - 7.5 6 - 7.5 6 - 7.5 6 - 7.5 11 - 12.5 13.5 - 19 14.5 - 19 16.5 - 20 21 - 22.5 21.5 - 25 22.5 23.5 - 25 24 - 27.5	1-9-12 1-9-12 1-1-6 1-1-12-13 1-1-13-13 1-13-13 1-1-13-13 1-1-13-13 1-1-13-13 1-1-13-13 1-1-13-13 1-13-13 1-13-13 1-13-	
	4-10-6 Same as above.	. 8. 5	#	B.O.B. 0 30'
1-1-5 Same as above.		21 - 22.5	•••	Same as above.
1-1-5 tem on above.	1-6-9 Seme as above.	18.5 - 20	£7.5	
1-7-9 Store fine grain tades.	5-7-9 Storm films grain shaft.			
5-7-9 Storm fine grain sade. Dry. 4-4-9 Same as above. Noist.	5-7-9 Stown fine grain salfb. Dry. 4-6-9 Same as above.			Pill discontibuos 0 appros. 16.5".
Gray silty vory fine grain sado. 9-7-9 Storm fine grain sado. Dry. 4-6-9 Same as above. 1-1-5 Same as above. Noist.	graf elity very fine grain sado. 5-7-9 Brown fine grain sado. Dry. 4-6-9 Same as above.	16 - 17.5	6-17-17	FILL - 1450 41 45000.
6-17-17 FILL - same as above. Fill discentiance 0 appres. 16.5. Gray silty very fine grain samp. 9-7-9 Store fine grain samp. Dry. 6-6-9 Same as above. 1-1-5 Same as above. Noist.	6-17-17 FILL - same as above. Fill discontinues 0 appear. 16.5°. Gray silty very fine grain SAMD. 5-7-9 Storm fine grain SAMD. Dry. 4-6-9 Stare as above.	13.5 - 15	5-7-19	No recovery.
6-17-17 Fild - same as above. Fild discontinues 0 appres. 16.8". Gray silty very fine grain samb. 9-7-9 Srown fine grain samb. Dry. 1-6-9 Same as above. 1-1-5 Same as above. Noist.	6-17-17 Fild - same as above. Fill discentiance 0 approx. 16.5. Gray silty very fine grain SAMO. 9-7-9 Storm fine grain SAMO. Dry. 1-6-9 Stame as above.	11 - 12.9	12-12-13	
12-12-13 PILL - poor recevery. 5-7-15 Bo recevery. 6-17-17 FILL - same as above. 7111 discontinues 0 and Grey silty very fine 9: 9-7-9 Brevm fine 9:sin 3240. 1-6-9 Same as above. Noise.	12-12-13 PILL - poor recevery. 5-7-19 Bo recevery. 6-17-17 FILL - same as above. 7111 discontiance 6 app of 111 discont	6.9 - 10	6-11-33	PILL - sems as above.
6-16-33 7714 - 3000 00 00000. 12-13-13 7014 - 9000 000000. 6-17-17 7714 - 3000 00 0000. 7111 410000010000 0 000 9-7-9 3000 00 0000. 1-6-9 3000 00 0000.	6-16-13	6 - 7.5	3-1-6	PILL - same as above.
1-1-6 (-10-13) 7114 - 1000 01 000000. 12-13-13) 7114 - 1000 01 00000. (-17-17) 7114 - 1000 01 0000. (-17-17) 7114 - 1000 01 0000. (-17-17) 7111 discontinues 0 000 (-17-19)	1-1-6 FILL - same as above. (-10-13 FILL - pase receivery. (-17-13 Mo receivery. (-17-17 FILL - same as above. FILL - same as above. FILL - same as above. 7111 discontinues 0 app or a same. 9-7-9 Brown fine grain same.	3.9 - 9	3-3-30/6	FILT - 1080 40 40000.
1-1-10/6	1-1-10/6 FILL - 1000 11 obero. 4-16-13 FILL - 1000 11 obero. 12-13-13 FILL - 1000 11 obero. 4-7-13 Do recently. 4-7-17 FILL - 1000 11 obero. FILL - 1000 11 obero. 9-7-9 From flat grain statt.		7-9-12	PILL consisting of black and brown sandy clay with various debris material including paper products, weed chips, cloth, tin, rubber, slaq, cinders, crushed limestene, an off-white crystalline substance, hay, and fine to cearse grain sand. Dry.
				Slack cinder fill on surface.
11-4-12 11-4-13 11-	11-4-7 1-1-4-1 1-1-4-1 1-1-1-1 1-1-1-1 1-1-1-1 1-1-1-1 1-1-1-1 1-1-1-1	Sample Dept.	n Blow Coun	
1-1-12 Count	1-1-12 1-1-13 1-1-13 1-1-13 1-1-13 1-1-13 1-1-13 1-1-13 1-1-13 1-1-13 1-1-13 1-1-13	Site Deed C	rook Sito-p	
7-9-12 1-1-4 1-1-4 1-1-4 1-1-13 6-16-13 6-17-17 6-17-17	7-9-12 1-1-10/6 1-1-13-13 1-1-13-13 1-1-13-13 1-1-13-13 1-1-13-13 1-1-13-13 1-1-13-13			

Site Dead Co	rook Sito-P	Sering/Well No. 7-4
Sample Depti	Slow Count	Description
	!	Fill material on surface.
1 - 2.5	3-3-9	FILL consisting of dark brown-black silty clay: some crushed limestone. small gravel, and fine to medium grain sand.
3.5 - 5	4-9-8	FILL - same as above with more debris material including paper products and wood chips.
6 - 7.5	3-4-6	FILL - same as above.
8.5 - 10	5-7-22	FILL - same as above.
11 - 12.5	6-7-7	FILL - poor recevery.
13.5 - 15	2-9-5	No recovery.
16 - 17.5	7-14-19	FILL consisting of brown silty CLAY. Some modium-rearse grain sand and small gravel. Trace of a pale yellow solid (hard and brittle) substance. Dry.
18.5 - 20	2-10-2	FILL - same as above. Trace of paper products and wood chips.
21 - 22.5	13-27-17	FILL - same as above with additional debris including asphalt, slag, crushed limestone, wire, and gravel.
23.5 - 25	4-6-8	FILL - same as above.
		Fill discontinuos et approx. 26'.
26 - 27.5	3-4-4	Brown fine grain SASO. Trace of silt. Moiat.
20.5 - 30	5-10-10	Same as above. Wet.
31 - 32.5	3-4-10	Srows fine to medium grain SASO. Wet.
33.5 - 35	5-10-13	Same as above. Trace of cearse grain sand. Wet.
		E.O.B. # 15'

Site Dead (reek Site-E	
Sample Dept	h Slow Coun	Description .
	1	Grass field area on surface.
1 - 2.5	4-5-7	PILL consisting of loose brown-black silty clay with crushed linestone. brick fragments, sand, and small gravel. Dry.
3.5 - 5	4-3-4	FILL - same as above with slag and cinder material.
6 - 7.5	1-2-1	FILL - same as above.
8.5 - 10	1-1-2	FILL consisting of brown-rod silty clay. Mottled. Some medium grain sand and small gravel.
11 - 12.5	2-2-2	FILL consisting of brown silty CLAF.
13.5 - 15	1-1-2	FILL - same as above.
16 - 17.5	1-1-1	FILL consisting of brown silty CLAF. Trace of fine grain sand. Hoist.
10.5 - 20	1-1-4	FILL - same as above. Trace of small gravel and asphalt.
21 - 22.5	7-2-3	FILL - same as above. Mottled.
		Pill discontinues # approx. 23'.
23.5 - 25	2-4-7	Light brown fine to sodium SAND. Dry.
26 - 27.5	2-4-6	Light brown fine to medium grain SAND. Trace of silt. Dry.
20.5 - 30	2-4-5	Brown fine grain SAFD. Wet.
31 - 32.5	6-7-8	Same as above. Trace of course grain sand. Wet.
11.5 - 35	7-11-13	Same as above. Trace of coarse grain sand and small gravel. Wet.
		E.O.B. 6 35'

Sample Depth 8	lew Count	Description
		Black cinder fill on surface
1 - 2.5	9-20-22	FILL consisting of black-gray silty clay with asphalt, cinders, sand, and gravel. Dry.
3.5 - 5	0-15-12	FILL - seme as above.
6 - 7.5	3-9-3	FILL - seme as above. Some wood chips.
0.5 - 10	3-6-2	FILL - same as above. With increased amount of debris including traces of rope, paper products, wood chips, and black stained sand.
11 - 12.5	1-3-13	FILL - same as above.
13.5 - 15	4-3-2	FILL - same as above. Fill discontinues 6 approx. 14' then dark gray silty CLAT. Moist.
16 - 17.5	3-5-7	Gray silty CLAY. Heist.
10/9 - 20	2-4-4	Gray sandy SILT. Trace of very fine grain sand. Dry.
21 - 22.5	3-5-9	Same as above.
23.5 - 25	1-2-2	Dark gray very fine grain SAMD. Some silt. Wet.
26 - 27.5	3-7-11	Light gray fine grain SAND. Trace of silt.
28.5 - 30	5-6-6	Gray SILT. Trace of very fine sand. Wet
31 - 32.5	3-4-11	Same as above. More fine grain sand. Wet.
12.5 - 15	1-3-6	Same as above.
		8.0.8. 0 15'

ito <u>Dood Cr</u>	eek \$ite-Q	Sering/Well No. 9-2/Well SEE-07
emple Depth	Blow Count	Description
		Black sandy CLAY with gravel and cinders. Fill on surface.
.5 - 5	NA.	FILL - speen refusal (possible rubber tire)
.5 - 10	RA.	No recovery.
3.5 - 15	33-10-8	FILL - poor recovery. Appears to be various debris including paper products. Fill discontinuos # approx. 17'.
1.5 - 20	5-4-13	Gray silty CLAY. Trace of very fine grain sand. Dry.
.5 - 25	3-4-3	Gray silt. Trace of very fine grain sand. Hoist.
1.5 - 30	5-10-13	Gray fine grain SAND. Hoist.
1.5 - 15	6-6-13	Gray fine to medium grain SANO. Wet.
5 - 37.5	-	Same as above.

Sering/Well Se. 9-3/Well SEE-28

Sample Depth Blow Count		Description		
1	i	Brown-black-gray suity clay FILL on surface.		
3.5 - 5	1-1-2	FILL consisting of black SILT. Trace of fine grain sand and black cinders. Thinnly laminated and crumbly.		
0.5 - 10	1-0-1	Same as above. Hoist at 9'.		
13.5 - 15	1-0-0	Same as above. Wet. Fill apparently discontinues # approx. 17'.		
18.5 - 20	2-3-4	Derk gray silty CLAY. Dry.		
23.5 - 25	2-3-7	Same as above. Some mettlemess. Heist at 25'.		
28.5 - 30	2-2-4	Jame as above.		
33.5 - 35	3-4-13	Gray fine to medium grain SASE. Wet.		
38.5 - 40	8-20-30	Same as above.		
		E.O.B. 0 40'		

Site Dead Creek Site-Q Sample Depth Siew Count 3.5 - 5 6-7-1 8.5 - 10 7-17-12	Brown-black silty CLAY FILL on surface. Trace of paper products and sand. No recevery - FILL FILL consisting of brown-black SILTY CLAY with some slag gravel, brick fragments, and broken glass. FILL - same as above. Heatly black ciaders, slag gravel, sand, and silt.
	No recevery - FILL
· · · · · · · · · · · · · · · · · · ·	FILL consisting of brown-black SILTY CLAY with some slag gravel. Brick fragments, and broken glass.
	PILL - same as above. Mostly black cinders, slag gravel, sand, and silt.
18.5 - 20 9-14-17	Gray to dark gray fine to sedium grain Shir. Heist.
23.5 - 25	Same as above. Mat.
28.5 - 30 2-3-13	Same as abers.
	8.0.9. 9 J3'.

*Et 0.8.		
.eveda as emel	11-10-13	20 - 2.00
deay than to medium stain them. Wet.	>-+- +	0t - 2.0t
- Cocoococa	431	25 - 2.65
No tocovory - fill apparently discentinues # 22".	433	18.5 - 20
He recevery. Pessible rubber tire.	431	61 - 6.61
. eveds as emit	₹-+-Z	01 - 5'0
FILL consisting of black clayer sand with some black cinders. (ly sentenced chips, and time to coerse grain send. Dry.	r-re-e	6 - 6·E
FILL secentais on surface.		
Describcio.	Siew Count	daqed elquet
Sorting/Well So. 3-5/Well scz-to	6-0278 HO	022 PP90 031S

Sample Depth 1	ller Count	Description
		Weil vegetated fill on surface.
1 - 2.5	5-6-6	FILL consists of brown silty CLAY. Trace of fine grain sand.
1.5 - 5	3-3-5	FILL consisting of dark brown silty CLAY and brown fine grain sand. Layered. Dry.
6 - 7.5	12-20-22	FILL consisting of brown very fine grain SAND. Some silt. Dry.
8.5 - 10	13-20-40	FILL consisting of brown silty clay and fine grain sand. Trace of coarse grain sand and brick fragments.
11 - 12.5	6-9-5	FILL consisting of brown modium to coarse grain SAMD. Trace of small to large gravel and crushed limestone. Dry. Fill discontinuos # 14°.
13.5 - 15	4-4-5	Brown SILP. Trace of very fine grain sand. Dry.
10.5 - 20	4-4-7	Light brown fine grain SASD. Dry.
23.5 - 25	9-18-20	Same as above.
28.5 - 30	10-15-19	Light brown modium grain SAND. Trace of coarse grain sand and small gravel. Not 8 38".
33.5 - 35	11-14-20	Same as above.
38.5 - 40	12-14-16	Same as above.
		8.0.8. 0 43'.

Site S	Boring/Well Ro. q-7/Well #EE-18		
Seaple.	Dopth	Blow Count	Description
	ĺ		Black cinder fill on surface.
			Straight drill to 25'.
			Stratigraphy sequence based on auger cuttings.
			0-18' FILL consisting of black clayer SAND with some black cinders, slag material, plastic and paper products, and wood chips.
18.5 -	20	10-17-24	Dark brown - dark gray SILT. Trace of very fine grain sand. Moist. Rust color and oil-like staining. Laminated.
23.5 -	25	4-4-5	Same as above.
28.5 -	30	3-5-4	Brown fine to modium grain SAMD. Wet.
33.5 -	35	4-6-10	Jame en above.
38.5 -	40	3-5-10	Decemes gray. Same as above. Trace of course grain sand.

Site Dead Creek Site-Q		Sering/Well Se. Q-8/Well eff-19
ample Depth 1	llew Count	Description
		Spent coal came in piles on surface.
		Straight drill to 10'.
		Stratigraphy sequence based on augor cuttings.
		0-28 FILL consisting of black cinders, sing gravel, and fine to coarse grain sand. Dry. Fill probably discontinues 8 approx. 20".
		28-28.5 Srown-gray SILT. Trace of clay.
0.5 - 30	0-12-15	dray very fine grain SASD. Trace of cilt.
3.5 - 35	8-13-16	Same as above. Trace of course grain sand.
0.5 - 40	7-10-14	Same as above.
	1	E.O.B. 0 43'.

APPENDIX C

AIR SAMPLING FLOW VOLUME CALCULATIONS AND CALIBRATION DATA

High Volume Sampler
Calibration Data

CALIBRATOR ORIFICE for HIGH VOLUME AIR SAMPLER

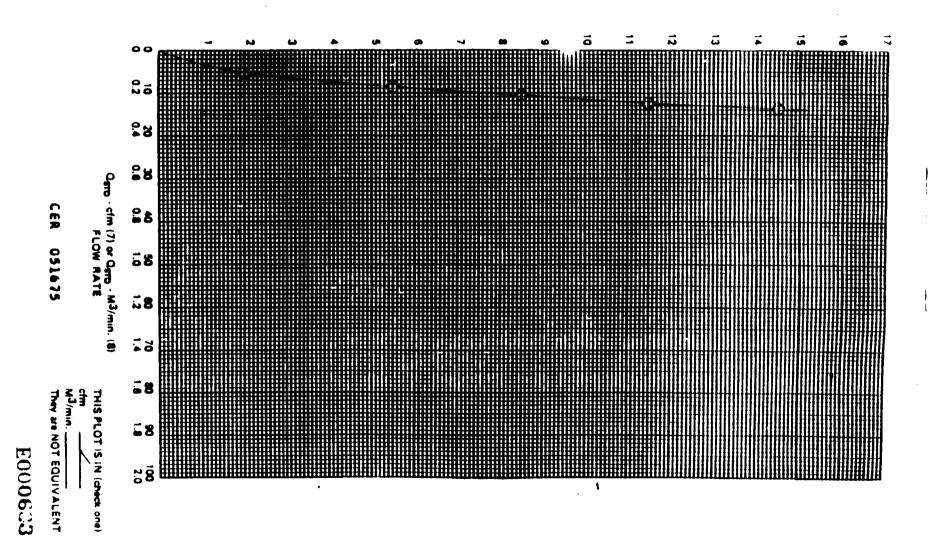
CERTIFICATE of CALIBRATION

SERIAL NO. 45-C



CER 051674

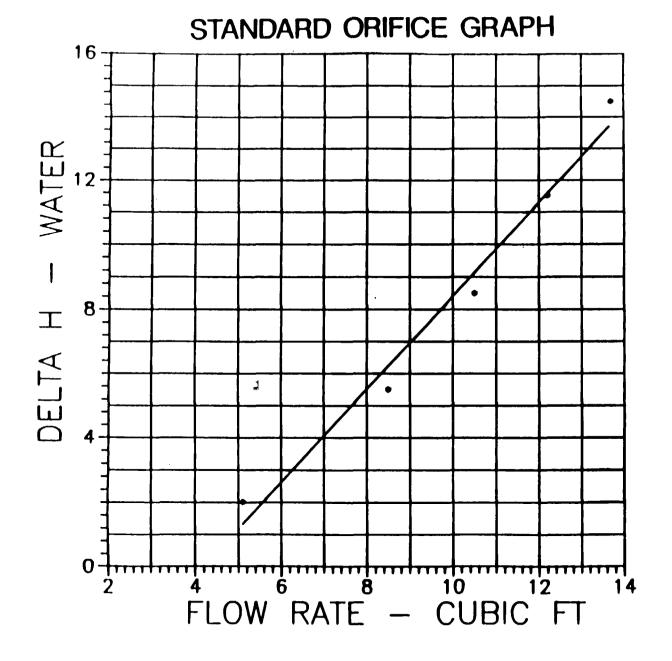
E000632











Name: A 'A	<u> </u>	oate: 7/,5/3:	7
Site Address:	ALAO CREEK - 31	11 G	
PS-1 Shelter No.	: <u> </u>	station Pressure	: <u>3.c2</u>
GMW Model 40 OCU	No.: 45-C	• ·	
Magnehelic Gauge -Reading-	Manometer Reading (in. H ₂ O) -	OCU Flow- Rate (tcfm)	Temp. (°C)
	3.7/3.6 NS.		64.8
6a	3.2/3/		
50	2.8/2.7		
40	2.3/3.8		
<u> 30</u>	1.7/1.6		
		·	
			
	NO SMARA ? 2 MAN		
4	PRECION 220° (<u> </u>	·· ······
<u></u>	d: 73 %		

Name:	EWALL .	_ Date:	7
Site Address:	MAN CRASK -	SIFAG	
PS-1 Shelter No	0.: <u> </u>	Station Pressure	:_ 30 01
GMW Model 40 00	CU No.: 45-C		
Magnehelic Gauge - Reading-	Manometer Reading (in. H ₂ O)	OCU Flow-	Temp. (°C)
76	38/36		64°F
60	34/32		••
	29/27		
- 40	2.4/2.3	•	
30	1.8/17		•••
	·	·	
		 .	
•			
Comments:	WIND SPARA D		
	MARCHON 230	(501)	
		_	
		 	

Name: 4	A WALL	Date: 7/15-1	' ' ' ' ' '
Site Address:	MAR CRARK . S.	ra G	
PS-1 Shelter No	1.: <u>56.3</u>	Station Pressure	: 3000
GMW Model 40 OC	U No.: 45-C	-	
Magnehelic Gauge Reading	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (OC)
70	18/37		64°F
_60	34/32		• (
50	2.9/28		
<u> 40 </u>	2.4/2.3		
30	1.8/1.7		
		•	
	·		
	•	•	
Comments:	WIND SPEED & MA		
	AIRMETON 220°	(sm)	
<u> </u>			
	•		

Name:	A. CAWALL	Da	te: <u>7/,-/</u>	27	
Site Addr	ess: Nem	CRAEL - SITE	G		
PS-1 Shel	ter No.:	. <u>4</u> St	ation Pressur	e: <u>30.0</u> :	2
GMW Model	40 OCU NO.:	45-C			
Magnehel Gauge Rea	ic Mand	meter -(in H ₂ O) -	OCU Flow- Rate (tcfm)	Temp	<u>°C)</u> -
_70'		3 7		64	<u>**</u>
60		/13		•	-
50		138			
40_		1/2:4	·		_
30		1.8			
			•		-
					-
Comments:	many es	ACA RMON			
	A. A. A. E. Fio	~ 220° (s	٠,	<u> </u>	
• ·	<u> </u>			······································	
	G				
	*			CER	051680

Name: A-A-ALL				
Site Address:	ABAN CRACK - 17	r_ c		
PS-1 Shelter No	·:	Station Pressure:	20 02	
GMW Model 40 OC	U No.: 45c			
Magnehelic Gauge Reading	Manometer Reading (in. H ₂ O)	OCU Plow- Rate (tcfm)	Temp. (°C)	
76	77/36		64%	
60	3.3/3.2		••	
	2.9/2.3			
40	2.4/3.3	·		
<u>&</u>	1.8/1.3			
	·			
Comments:	MARA & MAN	•		
	NAME TON 330 (<u></u>		
			•	
	·			

CER 051681

E000639

Name:	1 -1-WALL .	Date: 7/15/37	
Site Address:	ACAA CRAAL.	215 G	
PS-1 Shelter	No.:	Station Pressure:	<u> 3</u> 6 o 2
GMW Model 40	OCU No.: 45-C		
	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (°C)
20.68	3.7/3.6		64 4
60	<u>35/3.4</u> :4		•
	3.0/2.9 :		. •
40	2.4/2:4 56	· ·	•
<u>36</u>	1.3/1.8 54		
		·	
Comments:	WIND CARA! SA		
	A.2/55500 220°	(sw)	
			
			<u> </u>

مرمرم و عود ورس

Name: A CAWACC .		Date: 7/ac/f7	
Site Address:	AMA CREEK -	SIFE S/R	
PS-1 Shelter No).: <u>E4-/</u>	Station Pressure	e:30.3/ =
GMW Model 40°00	U No.: 45-C	-	
Magnehelic Gauge Reading	Manometer Reading (in. E ₂ 0)	OCU Flow Rate (tcfm)	Temp. (°C)
48	1 ATC 35/3	3.4	87°/
60	32/3.1		
50	27/2.6		
	_3.3/2.1	-	
30	1.6/1.6		` _
	•	•	
Comments:	<u> </u>	·	
		<u> </u>	
-			

Name:	SEUALL	Date: 7/20/	27
Site Address:	MAN CREPK	· sim s/R	
PS-1 Shelter No	.: <u>E1. 2</u>	Station Pressure:	30.3/
GMW Model 40 OC	U No.: <u>~5-</u>	_	
Magnehelic Gauge - Reading	Manometer Reading (in. H ₂ O)		Temp. (OC)
			890x
58 ***	3.2/3.2	-	
<u></u>	28/2.8		
	2.4/3.3	 ·	
30	1.8/1.3		<u></u>
			
Comments:			
	· · · · · · · · · · · · · · · · · · ·	-	
	•		

Name: 4	it wall	Date:	/27
Site Address:	CAM CRAFA	- SUFA 3/R	
PS-1 Shelter No).: <u> </u>	Station Pressure	: 30 2/
GMW Model 40 00	U No.: US-C		
Magnehelic Gauge Reading	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (OC)
	23/33		<u> 89°</u> F
_60	<u> </u>		
	<u>a e/a.7</u>		
40	<u>22/2:2</u>	 ·	
	17/17		
			
Comments:		·	
	·		·
	·		

Name:	it are	_ Date:	9 2
Site Address:_	LEPO CRALK	- SITE AIR	
PS-1 Shelter No	o.:	Station Pressure	:30.3/
GMW Model 40 00	CU No.:		
Magnehelic Gauge -Reading-	Manometer Reading (in. H ₂ O	OCU Flow- Rate (tcfm)	Temp. (°C)
58			8704
	23/3/		
<u> </u>	3.9/2.7		
	2.4/2.3	•	
30	1.9/18		
		·	
			
Comments:			
_		<u> </u>	
			

Name:	RWALL . D	ate:	127
Site Address:	PAPA CREAK -	SITE O/R	
PS-1 Shelter No	.: <u>/4:5</u> S	tation Pressure	30.21
GMW Model 40 OC	U No.: 45-C		
Magnehelic Gauge -Reading-	Manometer Reading (in. E ₂ 0)	OCU Flow- Rate (tcfm)	Temp. (°C)
_6=	36/15		59%
	33/3.2		
<u> </u>	28/27		
	2.4/2.3		
35	1.8/1.8		
		·	
Comments:			
·			

Name:	Shuiffle .	Date: 7/25/	2 7
Site Address:_	MAR CREEK	217 3/R	
PS-1 Shelter No	0.1	Station Pressure:	<u> 30.27</u>
GMW Model 40° O	CU No.: 45-6	-	
Magnehelic Gauge Reading	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (°C) -
- 64	35/3.4		29°E
65	3.4/33		
4-0	2.9/2.8	-	
<u> </u>	24/23		
36	1.3/1.7		
	-	•	
			
Comments:	•		
	•		
			·

Name: 12	wall.	ate: 7/22	137
Site Address:	AAAA CAAAR - SA	ras o/R	
PS-1 Shelter No).: <u> </u>	itation Pressure):
GMW Model 40 00	U No.: 45-C	•	
Magnehelic Gauge Reading	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (°C) -
*			
	<u> </u>	•	
***************************************		•	
4			
			
Comments: *	MA AMA CHURANTIO	N MA ARY	AUR FO
	DOTOR PAILURA		
			
· · · · · · · · · · · · · · · · · · ·	•		

Name: A. S	EWALL .	Date: 7/2.	3/87
Site Address:	MAD CRANK . S	ms ola	
PS-1 Shelter No).:	Station Pressure	: <u>30/0</u>
GMW Model 40°00	U No.: 75-C	-	
Magnehelic Gauge Reading	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (°C) -
50	2.9/2.8		<u> 56°</u>
40	2.4/2.4		
	1.8/1.8		
-		•	
			
			
	·		
Comments:	HER READING SO AF	STARY OF TANK	as cit
	LYE OPEN		
 -			

Name:	inch.	Date: 7/22	/27
Site Address:_	ALM CRASK	SIFAS O/R	
PS-1 Shelter No).: <u> </u>	Station Pressure	:
GMW Model 40 00	CU No.: 45-C	_	
Magnehelic Gauge Reading	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (OC) -
	32/3.3		_86_
60	22/3.2		
	28/27		
	2.3/2:2		
<u> 3c</u>	1.7/1.7		
		•	
Comments:			
		· · · · · · · · · · · · · · · · · · ·	

Name:	SAWALL .	Date:	87
Site Address:_	ARMA CRARK	- SIFES O/R	
PS-1 Shelter N	0.:	Station Pressure:	30 '0
GMW Model 40 0	CU No.: 45-C	_	
Magnehelic Gauge Reading-	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (°C) -
50	3.8/2.5		360
<u> </u>	2.3/2.3		
	1.8/1.8		
	·	·	
	 .		
		·	-
		-	
Comments:	•		
			

Name:	1. Shapel	Date: 7/32/3	27
Site Address:_	ALMA CREAK	- SITES O/R	
PS-1 Shelter No	.: <u>EK.5</u>	Station Pressure:	30 / 0
GMW Model 40 00	U No.: 45-C	_	
Magnehelic Gauge -Reading-	Manometer Reading (in. E ₂ O)	OCU Flow- Rate (tofm)	Temp. (OC) -
-54	30/31		56
50	28/2.7		
_40	23/22		
30	1.7/1.7	·	
			
		·	
			
Comments:	·-··-	· :	
			
	•		

Name:	StwALL .	Date: 7/22/	<i>(</i> 37
Site Address:	ARAA CRARK	· SITES O/R	
	·: <u> </u>		
GMW Model 40 OC	U No.: 45-C	_	
Magnehelic Gauge Reading	Manometer Reading (in. H ₂ O)	OCU Flow- Rate (tcfm)	Temp. (QC)
38	34/3/		<u> 86°</u>
	29/2.9		
<u> </u>	2.4/2.4		\
30	1.8/1.8	<u> </u>	
			
Comments:	-	<u>-</u>	
·	· · · · · · · · · · · · · · · · · · ·		
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High Volume Sampler
Air Volume Calculations

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> Greekerofrom E.E. & DONE DONE Some ALTER START UP (FLOWS CHAMPS). REPLACED Cir.vis

FIGURE 4. TYPICAL SAMPLING DATA FORM FOR HIGH VOLUME PESTICIDE/PCB SAMPLER

Les and special LIX ORI 12 00 Grien ; 000 Cal DING CALK , { N/13 6/18 04.30 97.57 18.90 18.90 129/11/8- 11 NOF 0633 1994 1 1 l CHANGE 124 046 9210 XX 13005 71 Emil. Stall . I 12 A 2001 30/ (250) 300 (300) 10 16 10 16 (at 1) fr. a 3, 53 (b) yer a 3, 53 (c) (c) (c) (c) (c) 34 23 87 mail mil oc 20 Ţ 14 I 1 X1.30 11.00 EC.X ţ I 104-20

steps forthe calculation of how sate of page.

$$V_{S+d} = V_{m} + \frac{P_{n} - \Delta P}{P_{S+0}} + \frac{T_{S+0} + 4(a)}{T_{n} + 4(a)}$$

$$V_{S+d} = V_{m} + \frac{P_{n} - \Delta P}{P_{S+0}} + \frac{T_{S+0} + 77^{\circ}P}{T_{n} + 4(a)}$$

$$V_{S+d} = \frac{T_{n} + 4(a)}{T_{n} + 4(a)}$$

$$V_{S+d} = \frac{V_{n} + V_{n}}{T_{n} + 4(a)}$$

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Ost 4 = 35.3 + 27.76-0.8 +1.025 = 12.22 cf

 $OST S = \frac{35.3}{2.538} + \frac{29.76 - 1}{29.72} + 1.025 = 13.70 CF_{-}$

. 1	alect in)	(1)	(cf.) (r)	6.648	.356	5 4 34	7.5 Yes.	7.63
(Total of calleting of Birtia)		المستقراءة (ز)		-1 -1 -1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		+92.1	819"	1.457	
(TOK 2021)	st o/R mm my		momente (AH)	20-4-J (in. 1/20)	3.5/3.4	3.2/3.1	2.7/2.6	2.2 /2.1	9.1/9.1
: 7-22-8-	EE-1 st 6		nogretale, M.	centif (x)	8.246	7.70		7 82 . 9	5.44
0.55 3.7-22-8-,	EE			Orto C	00	0	ν. •	4	**

(1)
$$T = 160 + 890 + 549$$
, $T_{543} = 537$
 $P = 30 \cdot 21$ in
 $S_{143} = 23793$
 $S_{143} = 2373$
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962.1
                  6.1/6.1 64.5
25.3
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                       50.7 02
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                  3.5/3.5
                         68.7
                  3.3/3.3
                         (x)
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0. To all case. 7-27-57 names and 514 EE-5 st G/RControl 18 (1)

magnetalic: $M^{(1)}$ monometer (aH)

angle Realing: $M^{(1)}$ monometer (aH) $M^{(1)}$ monometer (aH) $M^{(1)}$ monometer (aH) $M^{(1)}$ monometer (aH) $M^{(1)}$ monometer (aH) $M^{(1)}$ $M^{($

(1)
$$T = 460 + 890 = 549$$
, $T_{543} = 537$
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CEW 021105

5-3 7/16/87 SEC

Tre	- clapse Time. - (min)		Magnethe Rody (M)	(I)	- A=7	1.3.a.	(5) _A10_1d=
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Low Volume Sampler
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APPENDIX D

ANALYTICAL RESULTS

Explanation For Analytical Data Summary Tables

All ground water results in ug/l.

All soil sediment organic results in ug/kg

All soil/ segiment inorganic results in mg/kg

For sample location headings, the following qualifiers are used

+ Denotes blank samples.

Denotes duplicate samples.

Denotes that sample was not analyzed for the compounds listed.

For chemical results, the folling qualifiers are used :

B Compound detected in blank samples.

J Estimated value . Result is less than the

specified detection limit, but greater than zero.

Estimated value. Concentration detected exceeds the calibrated range.

C Fesult confirmed by GC/MS.

* Duplicate analysis not with in control limits.

R Spike sample recovery not with in control limits.

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APPENDIX E

SUMMARY TABLES FOR SITE-SPECIFIC CONTAMINANT LOADING TO THE HISSISSIPPI RIVER

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Source: Gentugg and Bartronment, 184 1960.

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Table 6 9

			Malghted Loading Area Flow Sate 9 Area Conc. to Sivet			Volctiles Weighted Leeding Carcinogenic PMae** Leeding San Corcinogenic PMae** Ave. Conc. to Siver Weighted Ave. Conc. to Siver Weighted Ave. Conc.					Total PRAces	Total Star Weighted Leading Ave Conc. to Bive	
	181.71	(ft*/dog)	ing/Li	(lb/dog)	ing/Li	() bydog (ind/Fi	(ib/day)	(mg/L)	(lb/day)	Alver (1b/dey)	109/1)	10/day
Johnsty	95,143	-109.49	132,000	-0.51	110,000	-5.07	~						
February	94,739	-472 14	132,000	-6.55	110,000	-5.00	•		•			-	
Mosch	10.340	-131-01	111,000	-1.01	119,000	-0.91	•		••			-	
	169,448	100 - 37	111,000	3.94	119,000	3.47	-		-	• •		••	
Moy	111.033	131-10	133,000	1.37	119,000	3.40	-		••			-	
June	111,170	-44 - 94	133,000	-0.57	119,000	-0.33	-		-				
July	107,547	-491 70	132,000	-3.73	119,000	-8 - 84	•		-				
August	99,491	-917.16	111,000	-7.57	310,000	-4 - 61	•	•-	••			•	
Supt eaber	94,120	-1,005-41	132,000	-4.54	119,000	- 7 . 10	•	•-	•			**	
***	99,119	-076 : 37	133,000	-7.33	110,000	-6 - 51	-		••			-	
Ho-cabot	99,454	-010 - 00	132,000	-1.41	119,000	-2.37	•		•			-	
Dec ember	100,030	-470.11	132,000	-3.00	110,000	- 3 . 50			•				_

[·] Total Organic Corbes

Begative sign designates contaminant nigration toward the siver.

Source: Scalogy and Saviconment, Inc. 1960

^{**} Polymeteer econotics

^{***} Data from monitoring multi-88-31, 88-31, 88-31, and 88-34 were used to calculate unighted average concentrations.

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APPENDIX F

TOXICITY PROFILES FOR SELECTED CONTAMINANTS OF CONCERN

Environmental Chemistry and Fate

Arsenic may be released to the atmosphere as a gas or vapor: or absorbed to particulate matter and transported to other media by dry or wet deposition (ATSDR 1987a). Because trivalent arsenic may undergo oxidation in the air, atmospheric arsenic is usually a mixture of trivalent and pentavalent forms. Most airborne arsenic is usually adsorbed on small diameter particulate matter. Photolysis is not considered to be an important fate process for arsenic.

Arsenic in surface vater can undergo a complex pattern of transformations: oxidation-reduction, ligand exchange, biotransformation, and precipitation and adsorption (Callahan 1979). As a consequence of these reactions, arsenic is extremely mobile in aquatic systems, and riverborne arsenic is capable of being transported great distances. Factors most strongly influencing the rates of these reactions include: Eh, Ph, metal sulfide and sulfide ion concentrations, iron concentration, presence of phosphorus minerals, temperature, salinity, and distribution and composition of biota (Callahan 1979).

Sorption onto clays, iron oxides, manganese compounds, and organic matter is an important fate in surface vater, with sediment serving as a reservoir for most of the arsenic entering surface vater. Sediment-bound trivalent and pentavalent arsenic, methylated by aerobic and anaerobic microorganisms, may be released back into the vater column.

Soluble forms of arsenic adsorb to soil and travel with the soil matter with which they are associated. Shifts in oxidation state may occur in either direction, depending on the particular characteristics of the soil and groundwater. Volatilization of methylated arsenics from groundwater is possible.

Arsenic in soil is predominantly found in an insoluble, adsorbed form. Clay with high anion-exchange capacity strongly adsorbs pentavalent arsenic. Other important adsorption processes include complexation and chelation by organic material, iron, or calcium. Leaching of arsenic is usually important in the top 30 centimeters of soil, but may also be important at greater depth in sandy soils. Arsenate predominates in aerobic soils; arsenite in slightly reduced soils; arsine.

genicity studies have reported conflicting results. Several studies have reported an increased incidence of bronchogenic carcinomas in rats exposed intratracheally to an arsenic-containing pesticide. Reasons for inconsistent carcinogenicity findings in animals may include inappropriate selection of an animal model, and use of flaved study designs. In humans, epidemiologic studies and case reports have reported that arsenic is associated with tumors of the skin, lungs, genital organs, and visual organs (EPA 1984f, EPA 1985c, ATSDR 1987a).

EPA has classified arsenic in Group A, i.e., a human carcinogen, based on extensive evidence of human carcinogenicity through inhalation and ingestion exposure (EPA 1985c).

Drinking Vater Standards and Criteria

Standards. The current MCL for arsenic under the National Interim Drinking Vater Regulations is 50 ug/L. The NAS Drinking Vater Committee has analyzed the toxicology of arsenic (NAS 1983a). Based upon this evaluation, NAS recommended the retention of the MCL pending resolution of the question whether arsenic is an essential element in the human diet.

NAS also examined the available epidemiologic studies which were designed to investigate the relationship between arsenic exposure and skin cancer in the United States. The conclusion of the report was that these studies lacked statistical power to determine if arsenic causes skin cancer. However, the report stated that precursors of skin cancer, normally seen in cases of arsenic-induced skin cancer, were not seen in these studies.

Consistent with the NAS recommendations, EPA has proposed that the MCLG remain at the current MCL of 50 ug/L. In its determination, EPA stated that the MCL was below concentrations at which noncarcinogenic toxicity had been demonstrated and was within the concentration range which might be, based on further investigation, essential for humans (EPA 1985c).

Criteria. Based upon recommendations of NAS, EPA has proposed that all health advisories for arsenic be set at 50 ug/L (EPA 1985d). The EPA ambient water quality criterion for the protection of human health

BENZENE

Environmental Chemistry and Fate

The relevant physical and chemical properties and environmental fate of benzene (CAS No. 71-43-2) are summarized below (EPA 1986a).

Molecular Weight (g/mole)	78
Vater Solubility (mg/L at 25°C)	1,750
Vapor Pressure (mmHg at 25°C)	95.2
Henry's Law Constant (atm-m3/mole)	5.6 x 10 ⁻³
Log Kov	2.12
K _{oc}	83
BCT	5.2

Benzene has a high vater solubility and vapor pressure. As a consequence of these two properties, benzene can be characterized as a highly mobile chemical. For benzene released to air, some rainvater vashout is anticipated. After deposition in vater or soil, volatilization is expected to return some portion back to the atmosphere. Based on its high Henry's Law Constant, volatilization will result in substantial loss to the atmosphere following release to vater.

Due to its high water solubility and high vapor pressure, transport to sediments is not expected to be major surface water fate process.

Benzene released to soil can be transported to air via volatilization, to surface vater via runoff, and to groundwater via leaching. The first two pathways predominate in surficial soil, whereas the latter pathway predominates at lower soil depths.

According to criteria developed by Kenaga (1980), benzene with a $K_{\rm oc}$ of 83 would be considered to be mobile in soils. Other factors

Drinking Vater Standards

EPA has established a final drinking water MCL of 5 ug/L (EPA 1987a).

CER 051780

Cadmium is not reduced or methylated by microorganisms. However, the biological production of sulfide results in cadmium precipitation. Cadmium is strongly accumulated by all organisms, with concentrations in freshwater and marine organisms hundreds to thousands of times higher than in water being typical. Bioaccumulation of cadmium is strongly correlated with soil cation-exchange capacity (CEC), decreasing with increasing CEC. Bioconcentration in aquatic life is greatest for bottom feeders (e.g. mollusks and crustaceons), followed by fish and aquatic plants (ATSDR, 1987h). Bioaccumulation due to the use of cadmium-containing pesticides on food crops has been noted in beef and poultry.

Noncarcinogenic Effects

Acute and chronic exposure to cadmium in animals and humans results in renal dysfunction, hypertension, anemia, and altered liver microsomal activity. The kidney is considered to be the critical target organ in humans chronically exposed to cadmium by ingestion. The early clinical signs of renal injury include proteinuria, glucosuria, and aminoaciduria.

To calculate a drinking vater equivalent level (DVEL), EPA used renal dysfunction as an endpoint, and the most videly accepted estimate for the critical (threshold) concentration of cadmium in the renal cortex--200 ug/g. Using a 4.5% absorption of the daily dose and 0.01% excretion in the total body burden per day, EPA calculated an LOAEL of 352 ug/day for renal effects in humans. Incorporating an uncertainty factor of 10, EPA has developed an RfD of 35 ug/day. Adjusting the RfD for consumption of 2 liters of vater per day, EPA has derived a provisional DVEL of 18 ug/L (EPA 1985c).

Embryotoxic and teratogenic effects have been demonstrated in many mammalian species following parenteral administration of high doses of cadmium. In contrast, there is little evidence of these effects at lower doses by either of the more relevant inhalation or oral exposure routes (EPA 1981, ATSDR 1987h).

CER 051781

Carcinogenicity and Mutagenicity

Cadmium chloride aerosol administered by inhalation for 18 months produced lung tumors in rats. In contrast, all cancer bioassays in

CHLOROBENZENE

Environmental Chemistry and Fate

The relevant physical and chemical properties and environmental fate of chlorobenzene (CAS No. 108-90-7) are summarized below (EPA 1986a).

Molecular Weight (g/mole)	113
Water Solubility (mg/L at 25°C)	466
Vapor Pressure (mmHg at 25°C)	11.7
Henry's Law Constant (atm-m ³ /mole)	3.7×10^{-3}
Log K	2.84
Koc	330
BCF	10

Chlorobenzene's moderate water solubility, vapor pressure, and Henry's Law Constant indicate that volatilization from surficial soils and surface water is a major transport pathway.

Once adsorbed on soil, the moderate solubility and $K_{\rm oc}$ (330) indicate that chlorobenzene will leach and be transported to groundwater. The degree and rate of leaching will depend on a variety of factors including the soil type, organic carbon content, and the presence of organic solvents in the soil. Once chlorobenzene reaches the groundwater, the $K_{\rm oc}$ indicates that retardation relative to the groundwater flow will occur due to partitioning and adsorption to soil particles.

Current data indicate that degradation of chlorobenzene in aquatic systems is slow (EPA 1985). The estimated BCF of 10 indicates that monochlorobenzene is only slightly bioconcentrated in aquatic life.

The lifetime HA of 600 ug/L was derived from the NOAEL used in the derivation of the longer-term HA, using an additional uncertainty factor of 10 and assuming that drinking water comprises 20% of the total daily intake.

NAS has estimated, based upon the draft NTP, that a drinking water concentration of 2.3 ug/L would correspond to an estimated one-in-a-million incremental excess lifetime cancer risk (NAS 1983).

EPA has developed an ambient vater quality criterion for the protection of human health of 488 ug/L and for organoleptic (odor and taste) effects of 20 ug/L (EPA 1980a).

Noncarcinogenic Effects

In rodents subjected to acute high oral exposures, CP and DCP elicited respiratory excitation, clonic convulsions, and/or motor weakness (hypotonia). Few long-term animal studies are available. Those few that are available show reduction in hematological parameters or enzyme changes. No data were found concerning effects of CP and DCP on the developing embryo or the reproductive process.

Carcinogenicity and Mutagenicity

No data were found concerning the potential carcinogenicity of CP or DCP by the oral route. However, CP and DCP were reported to promote tumors following a single dermal application of dimethylbensanthracene on mouse skin (Boutvell and Bosch, 1959).

CP has been shown to be mutagenic in Sprague Davley rats fed 130 mg/kg CP every other day for one week (Chung 1978). In these rats a six-fold increased incidence of chromatid deletions (12% vs. 2% in controls) was seen. Complete inhibition of mitosis was reported in bone marrow cells taken from treated rats.

DCP, tested using the Ames <u>Salmonella</u> microsomal assay, vas reported as not mutagenic with and without activation.

Consequently, whereas CP can be classified as mutagenic, there are insufficient data to evaluate the mutagenicity of DCP.

Drinking Vater Standards

EPA has not issued any drinking water standards, health advisories, or other criteria for CP or DCP.

CNS depression; blood dyscrasias; and lung, kidney, and liver damage. Similar data are not available for m-dichlorobenzene (1.3-dichlorobenzene or m-DCB). However, based upon short-term assays, EPA has determined that short-term assessments developed for o-DCB should apply to m-DCB.

Carcinogenicity and Mutagenicity

The few studies available on the carcinogenic potential of the DCBs have been negative or insufficient to clearly classify any DCB isomer as carcinogenic. Preliminary results of an NTP gavage bioassay indicate that o-DCB was not carcinogenic under the conditions of the experiment. Pending receipt of the final NTP report for o-DCB, EPA has categorized o-DCB according to Agency weight-of-evidence carcinogenicity criteria in Group D, not classifiable as to human carcinogenicity (EPA 1987d). EPA has classified p-DCB in group C, limited evidence of carcinogenicity in animal studies (EPA 1987a).

In general, DCBs have shown little or no mutagenic activity in a range of bacterial systems. However, several studies with mold and plant cultures treated with DCBs have reported mutations and chromosomal alterations (EPA 1987d).

Drinking Vater Standards and Criteria

EPA has established a final drinking vater MCL for p-dichlorobenzene of 75 ug/l (EPA 1987a). This MCL was based on a reference dose of 0.1 mg/kg/day, an uncertainty factor of 10, allocation of 20% of total human intake from all exposure sources to drinking vater and various intake and physiological assumptions. EPA is also in the process of establishing an enforceable MCL for o-DCB and p-DCB, but not m-DCB. As a first step in the process, EPA has issued a proposed MCLG for o-DCB based upon a NOAEL reported in a subchronic gavage study in mice and rats. Based upon a NOAEL of 125 mg/kg/day, an uncertainty factor of 100, and the same assumptions as for p-DCB, EPA has derived a proposed MCLG for o-DCB of 620 ug/L.

In the absence of sufficient data, EPA has not developed, and is not in the process of developing, a drinking water standard for m-DCB.

nauses, and general weakness. Effects on the liver include necrosis and epithelial cell damage, and on the kidney, degeneration of the proximal tubule (EPA 1985b)

Carcinogenicity and Mutagenicity

In a NCI bioassay, EDC administered by gavage vas shown to increase the incidence of tumors in both mice and rats. Based upon these data, EPA has classified EDC according to weight-of-evidence carcinogenicity criteria in Group B₂ - probable human carcinogen (EPA 1987a).

EDC has shown to induce gene mutations in bacteria, plants,

Drosophilia melanogaster, and cultured Chinese hamster ovary cells (EPA
1985i). In addition, EDC has been reported to cause meiotic chromosomal
disjunction in Drosophilia. Based upon these data, EPA has determined
based upon weight-of-evidence criteria that EDC is a mutagen that may
have the potential for causing adverse effects in humans (EPA 1985i).

Drinking Vater Standards and Criteria

Standards. In the first stage of a procedure to establish an enforceable HCL for EDC in drinking vater, EPA has established a MCLG of 0. This HCLG was predicated on the EPA conclusion that no exposure to a "probable human carcinogen" is acceptable. Based upon considerations of analytical feasibility and feasibility of control, EPA has issued a MCL for EDC of 5 ug/L.

Criteria. In the absence of suitable data, EPA has not developed 1-day or 10-day EAs for EDC. EPA has, however, developed a longer-term EA based upon a NOAEL reported in a rat inhalation study. Based upon a NOAEL of 405 mg/m³, an uncertainty factor of 100 and various intake assumptions and physiological parameters, EPA derived longer-terms EAs of 740 ug/L (10-kg child) and 2,600 ug/L (70-kg adult) (EPA 1985d). Because EDC was judged to be a probable human carcinogen, EPA did not develop a lifetime EA for noncarcinogenic effects.

EPA has not developed an ambient water quality criterion for EDC for the protection of human health.

ceiving HCB orally reported both fetotoxicity and teratogenicity (EPA 1985g). The effects noted in these studies included cleft palate, reduced fetal viability, reduced neonatal weight gain and reduced relative fetal weight (EPA 1987g).

Carcinogenicity and Mutagenicity

Lifetime animal carcinogenicity studies have revealed that HCB elicited statistically significant increased tumor incidences in rats, mice, and hamsters. Based on these data, EPA has placed HCB in its carcinogenicity category B₂ as a probable human carcinogen.

Drinking Vater Standards and Criteria

EPA has not developed a drinking vater standard for HCB. The EPA one-day and 10-day and longer health advisories (HAs) for a 10-kg child are each 50 ug/L. The longer-term HA is 175 ug/L for a 70-kg adult. The EPA reference concentration for a potential carcinogen risk of 1×10^{-6} is 0.02 ug/L.

EPA has concluded that all of the above effects point toward a generalized impairment of normal physiological functioning of several different organ systems as adult PbB levels exceed 30 to 40 ug/dl. Evidence of impaired heme synthesis effects in blood occur at even lover levels.

More recent research has indicated that there is a relationship between PbB levels and increases in blood pressure. Preliminary review of this work indicates a statistically significant correlation between PbB levels and diastolic blood pressure in white males, ages 40 to 50, with no threshold apparent in the range of 6 to 30 ug/dl. Of particular concern is the finding of a 2 mm Hg increase in diastolic pressure per incremental PbB level increase of 0.5 ug/dl. Possible increases in risk of more severe medical events (stroke, heart attack, death) associated with lead-induced increases in blood pressure are also estimated in one of the recently published studies.

Children represent a sensitive subpopulation with regard to lead toxicity. As with adults, lead affects many different ogan systems and biochemical/physiological processes across a vide range of exposure levels. Effective PbB levels for producing encephalopathy or death in children are lover than in adults, starting at approximately 80 to 100 ug/dl. Permanent metal retardation and other marked neurological deficits are among lasting neurological sequelae typically seen in cases of nonfatal childhood lead encephalopathy. Other overt neurological signs and symptoms of subencepthalopathic lead intoxication, such as peripheral neuropathies (functional and/or pathological changes in the peripheral nervous system), have been detected in some children at PbB levels as low as 40 to 60 ug/dl. Chronic kidney disease is not evident at PbB levels above 100 ug/dl. Horeover, colic and other overt gastrointestinal symptoms occur in children, at least down to 60 ug/dl. Rank anemia is also evident at 70 ug/dl, representing an extreme manifestation of reduced hemoglobin synthesis at PbB levels as low as 40 ug/dl. All these effects are videly accepted as adverse health effects, and are reflective of videspread marked impact of lead on the normal physiclogical functioning of many different organ systems (EPA 1984d, 1985c. ATSDR 1987j).

any major anomalies. There are also no reliable data pointing to adverse effects in human offspring following lead exposure to fathers.

EPA has concluded that the current collective human data regarding lead's effects on reproduction on in utero development are insufficient for accurate estimation of exposure-effect or no-effect levels (EPA 1984d). In the absence of sufficient data, it has been suggested that it would be prudent to avoid lead exposures resulting in PbB levels exceeding 25 to 30 ug/dl to pregnant vomen and vomen of child-bearing age in general. This conclusion was based on the known equilibration between maternal and fetal blood lead concentrations and growing evidence of deleterious effects in young children as PbB levels approach 25 to 30 ug/dl. Industrial lead exposure of men with PbB levels of 40 to 50 ug/dl also appears to result in altered testicular function.

Carcinogenicity

Several studies have reported renal tumors in Vistar rats following ingestion of high doses of a lead salt (lead acetate). Lead subacetate (another lead salt) has produced benign tumors (renal carcinomas or adenomas) in Swiss mice and seveal strains of rats, but not golden hamsters. Glimomas (CNS tumors) were also observed in many of these studies.

There have been a number of epidemiological studies which have assessed the mortality experience of lead-exposed workers. In some of the studies, no excess cancer mortality was observed. In one study, non-statistically significant excess cancer mortality of the respiratory system and cancer of the digestive organs and peritoneum was reported which on evaluation by other statistical techniques by another investigator was reported to achieve statistical significance. Another study has reported increased mortality from renal cancer among a group of lead smelting workers. However, this excess mortality, based on only six cases, did not achieve statistical significance. On review of all of these studies, EPA concluded that the absence of good lead exposure documentation made it difficult to assess the contribution of lead to the observed results.

The International Agency for Research on Cancer (IARC) has classified lead in Group 3, inadequate evidence for carcinogenicity in humans.

4-METHYL-2-PENTANONE

Environmental Chemistry and Fate

The relevant physical and chemical properties and environmental fate of 4-methyl-2-pentanone are summarized below (Verscheuren 1983).

Molecular Weight (g/mole)	100
Vater Solubility (mg/L at 25°C)	19,000
Vapor Pressure (mmHg at 25°C)	6 (20°C)
Henry's Law Constant (atm-m /mole)	no data found
Log Kow	no data found
K _{oc}	no data found
BCF	no data found

4-methyl-2-pentanone (MIBK) has a high vater solubility and moderate vapor pressure. As a consequence of these two properties, benzene can be characterized as a moderately mobile chemical. For MIBK released to air, some rainvater vashout is anticipated. After deposition in vater or soil, volatilization is expected to return some portion back to the atmosphere.

Due to its high water solubility and moderate vapor pressure, some transport to sediments is expected.

HIBK released to soil can be transported to air via volatilization, to surface water via runoff, and to groundwater via leaching. The first two pathways predominate in surficial soil whereas the latter pathway predominates at lower soil depths.

CER 051790

Noncarcinogenic Effects

In high concentrations, HIBK produces narcosis with symptoms of headache, nauses, lightheadedness, and vomiting.

NAPHTHALENE

Environmental Chemistry and Fate

The relevant physical and chemical properties and environmental fate of naphthalene (CAS No. 91-20-3) are summarized below (EPA 1984).

Molecular Veight (g/mole)	128
Water Solubility (mg/L at 25°C)	31.7
Vapor Pressure (mmHg at 25°C)	0.082
Henry's Law Constant (atm-m /mole)	no data found
Log Kov	3.37
K _{oc}	no data found
BCP	1.46

Naphthalene has a moderate vater solubility and moderate vapor pressure. As a consequence of these two properties, benzene can be characterized as a moderately mobile chemical. For naphthalene release to air, some rainvater vashout is anticipated. After deposition in vater or soil, volatilization is expected to return some portion back to the atmosphere.

Due to its moderate vater solubility and moderate vapor pressure, transport to sediments is expected to be a major surface vater fate process.

Naphthalene released to soil can be transported to air via volatilization, to surface water via runoff, and to groundwater via leaching. The first two pathways predominate in surficial soil, whereas the latter pathway predominates at lower soil depths.

CER 051791

Noncarcinogenic Effects

Exposure to maphthalene by the ingestion, inhalation and dermal routes has been reported to result in intravascular hemolysis, corneal

to each injection. The naphthalene also contained approximately 10% methylnaphthalene.

In a second study, Knake (1956 as reported in USEPA 1980) painted a group of mice with either benzene or a solution of coal tar naphthalene in benzene and noted an excess of lymphatic leukemia in the group treated with the naphthalene/benzene solution as compared to those treated with benzene alone (4 vs. 0 cases, respectively). These results are difficult to interpret because benzene is a known animal carcinogen.

Naphthalene when combined with rat microsomal fractions has been found to be nonmutagenic in bacterial mutagenesis assays (EPA 1980).

Drinking Vater Standards and Criteria

EPA has not developed any drinking vater standards or health advisories or ambient vater quality criteria for human health for napthalene.

CER C51792

Studies evaluating the effects of nickel administration on animal reproductive systems have produced varying results. Nickel is known to cross the placental barrier in animals, and some data suggest this is also true for humans. Intraperitoneal and intravenous injections of nickel compounds have produced some tetratogenic effects in animals. Increased fetal mortality and reduced fetal veights also were observed. In some studies, high dosages resulted in reduced fetal survival and decreased fetal veights in the absence of frank teratogenesis.

Feeding studies involving administration of various nickel compounds to rats are more applicable to human exposure situations. Various studies have reported a correlation between nickel concentration in food or vater and reproductive performance (ATSDR, 1987b). Nickel exposure has also been reported to impair male gametogenesis in mice and rats. No adverse reproductive effects linked to nickel exposure have been reported in humans.

Carcinogenicity and Mutagenicity

The chemical form and route of exposure may be important factors in determining the carcinogenic potential of nickel. Insoluble nickel compounds (e.g., metallic nickel, nickel subsulfide, and nickel carbonyl) have been shown to produce tumors following inhalation exposure. However, multiple studies in which nickel was administered orally to rats and mice have been uniformly negative (EPA 1985c). In humans, excess respiratory cancer mortality has been demonstrated in epidemiological studies of nickel smelting and refining workers.

EPA has classified nickel in group B₂--sufficient evidence for carcinogenicity in animals, limited evidence in humans--according to guidelines for carcinogenic risk assessment (EPA, 1986b) for the in-halation route, based upon the positive animal evidence for nickel subsulfide and carbonyl compounds. However, reflecting the negative animal carcinogenicity data, the Agency has categorized nickel in Group D - inadequate evidence for the oral route of exposure.

Nickel chloride was not mutagenic, whereas nickel sulfate was found to be mutagenic in in vitro assays.

PENTACHLOROPHENOL (PCP)

Introduction

Commercial pentachlorophenol (PCP) is contaminanted with two chemicals - hexachlorobenzene (HCB), and hexachlorodibenzo-p-dioxin (HxCOD) which are currently categorized by EPA in its category B₂ as probable human carcinogens. Both are also potential reproductive toxins. PCP is also contaminated with polychlorinated dibenzofurans. This profile primarily addresses the toxicity of commercial PCP. The reader is referred to the profiles for HCB, HxCDD, and dibenzofurans for further information relevant to evaluating the potential toxicity of commercial PCP.

Environmental Chemistry and Fate

The relevant physical and chemical properties for pentachlorophenol (CAS No. 87-86-3) are summarized below (EPA 1986a).

Molecular Veight (g/mole)	266
Vater Solubility (mg/L at 25°C)	14
Vapor Pressure (mmHg at 25°C)	1.1 x 10 ⁻⁴
Henry's Law Constant (atm-m /mole)	2.8 x 10 ⁻⁶
Log Kow	5
K _{oc}	53,000
BCF	770

Pentachlorophenol (PCP) has a moderate vater solubility, low vapor pressure, low Henry's Law Constant, and high $K_{\rm oc}$. Based upon its $K_{\rm oc}$ and low vapor pressure, PCB would be strongly bound to surface soil. The $K_{\rm oc}$ of 53,000 indicates that leaching from soils and transport to groundwater is a slow process. PCP is resistant to biodegradation. The low Henry's Law Constant and high $K_{\rm oc}$ indicate that PCP will be strongly partitioned to surface water sediments. Finally, the BCF indicates

served in fetuses include cleft palate, reduced fetal viability, reduced neonatal veight gain, and reduced relative neonatal veight. Based on these studies, EPA set the NOEL for HCB at 1.0 mg/kg/day (EPA 1987g).

Carcinogenicity and Mutagenicity

Pure pentachlorophenol has not been reported to be carcinogenic in a number of animal studies (EPA 1987g). It has also produced negative results in an initiation/promotion study. These results are consistent with mutagenicity studies which have primarily been negative (EPA 1987g).

However, ExCDD and HCB have both been found to be oncogenic in animal studies (EPA 1987g). The EPA estimated 95% upper bound carcinogenic potencies of 6.2 x 10³ and 1.67 mg/kg/day, for ExCDD and HCB, respectively (EPA 1986a, EPA 1987g).

Drinking Vater Standards and Criteria

EPA has issued no drinking water standards for PCP, HCB, or HxCDD. EPA has issued a proposed HCLG for PCP of 200 ug/L, based upon a DVEL of 1.01 mg/L, and assuming a drinking water contribution of 20% to total daily PCP intake (EPA 1985a).

EPA has developed health advisories for a 10 kg child and a 70 kg adult for PCP and HCB, but not for HxCDD. The EPA health advisory limits and reference concentrations for potential carcinogens for PCP and its major contaminants are summarized in the following table.

	One-day	Ten-day	Long	term	Lifetime	Reference
	10 kg	10 kg	10 kg	70 kg	70 kg	Concentration*
Pentachlorophenol	1000	300	300	1050	1050	
Hexachlorobensene	50	50	50	175		0.02
ExCDO						
Dibenzofurans						

Source: EPA, 1986a

- No limit developed.
- * Corresponding to a 1 x 10⁻⁶ cancer risk.
 All concentrations in ug/L.

Noncarcinogenic Effects

Phenol is a highly toxic compound that may enter the body via skin absorption, vapor inhalation, and ingestion. Based on the available human and animal data, exposure to large doses by any route of exposure can lead to serious illness or death. Toxic doses in human and species exhibit similar symptoms: initial increases in heart rate, labored breathing, cyanosis, and pulmonary edema. The present data do not indicate that phenol to be teratogenic.

Carcinogenicity and Mutagenicity

Based upon the limited animal data, the EPA has classified phenol in category D - inadequate evidence to evaluate carcinogenicity.

The mutagenicity data are equivocal presenting on balance, equivocal evidence of mutagenicity.

Drinking Vater Standards and Criteria

EPA has not classified drinking vater standards or criteria for phenol.

PHYSICAL AND CHEMICAL PROPERTIES OF PCBs.

Arecler Designeties	trecier Helecular Weight Color besignation (average)		Mysical State	Obysical Solubility State water, mg/L g/	Desetty g/cs at 25°C	Monty's Lauth Make unter, mg/L g/cm at 28°C Leg Octamel-Mater* (mm Mg at 28°C) atm-m/mei at 25°C Factor***	Vapor Pressure (mm Mg at 25°C)	Menty's Laus- Constant 1 mol at 25°C	Biocontration
9101	287.9	Close	110	.0.0	66.4	9.8	9 -91	, of	
1221	200.7	Close		0.59 (24°C)	1.19	7.3	6.3 a 10 ⁻³	3.5 = 10 ⁻³	•
1333	232.2	Clear	170	Saksous	1.24	8.1	4.06 ± 10 ⁻³	Unknown	
1343	266.5	Close	=	•.24	1.33	5.6	1.06 2 10-4	5.2 # 10 ⁻⁴	
1240	299.5	Close	170		17.1	6.2	4.94 & 10 ⁻⁴	2.0 t 10 ⁻³	10,500
1384	328.4	Lt. Tollow	VACCOUR		2.1	6.5	7.71 # 10-5	2.0 a 10 s	100,000
			114114				,		
1260	175.7	Lt. Yellow	setchy	6.6627	1.50	• •	1.05 ± 10-5	4.4 a 10-3	190,000
			E						

these leg Kew values septement an average value for the major compensate of the individual Asocles. Heaty's Law constants were estimated by dividing the vapor pressure by the unter solubilities, and septement average values for the Asocles mistures as a whole (ATSDA 1907s).

... From Lymen, Bookl, and Rosembladt [1982].

Source: Unless etherwise specified, from ATSDE (19871).

stitution may, in fact, vary significantly in isomer composition. Additionally, highly toxic contaminants are often present in PCB mixtures.

In general, however, it can be concluded that short and intermediate-term studies of toxicological effects following oral administration of PCBs to animals result in a variety of physiological and morphological alterations in the liver, including: enlargement, fatty infiltration, centrilobular lesions, and effects on liver porphyrin metabolism. The major biochemical effects include induction of mixed function oxidase enzymes and modification of porphyrin metabolism. PCBs can also inmibit the immune system. Skin applications to rabbits has been shown to cause erythems, keratosis, and chloracne.

Human studies related to PCB exposures have been done on the health of occupationally exposed workers, as well as on health effects noted following two incidents in which cooking oils contaminated with PCBs were ingested. Occupationally exposed workers typically demonstrated dermal problems such as chloracne, rashes, and burning sensations. While most biochemical parameters in these studies were found to be within normal ranges, one study reported an elevation of liver enzymes in exposed workers.

The two incidents, or outbreaks, concerning the ingestion of PCB-tainted cooking oils occurred in east Asia. The first incident, designated as the "Tusho" outbreak, occurred among Japanese (Higachi, 1976; Kurotsone and Shapiro, 1984); while the second, designated "Taichung", occurred among Taivanese (Hsu et al, 1984; Lu and Wang, 1984). Health effects observed in humans following exposure included: chloracne, increased discharge from the eyes, soreness and veakness of limbs, headaches, dissiness, and general malaise. Because the cooking oil in the Yusho study was also found to be contaminated with highly toxic polychlorinated dibenzofurans, implications cannot be limited to PCBs alone in this study.

CER 051798

Reproduction and Development

The range of reported effects on reproduction in animals include: a lengthening of the estrus cycle, weak estrogenic activity, fetotoxicity, fetal deaths, decreased survival of the neonate, small birth weight, and

in humans, sufficient evidence in animals, and inadequate evidence of activity in short-term mutagenicity tests.

EPA's cancer assessment group has calculated a unit cancer risk of 4.34 (mg/kg/day)⁻¹, using the upper 95 percent value of the doses used in the positive study (Kimbrough et al 1975).

Standards and Criteria

Drinking Vater

As the first stage in developing a maximum contaminant level (MCL) for PCBs in drinking vater, the EPA has recently proposed an MCLG of zero. EPA vill establish an MCL taking into account technological feasibility of control and analytical feasibility (EPA 1988).

Surface Vater

The EPA has established ambient vater quality criteria for the protection of freshwater and saltvater aquatic life of 0.014 ug/l and 0.03 ug/l, respectively. For human health, EPA has estimated the drinking vater concentration corresponding to one-in-a-million cancer excess of 0.0079 ng/l.

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... Lyman, Bothl, and Rusemblatt (1982).

Table 2

EPA CARCINOGENICITY CATEGORIZATION FOR ORAL AND INNALATION
ROUTES OF EXPOSURE FOR THE 15 PRIORITY POLLUTANTS POLYCYCLIC AROMATIC HYDROCARSONS

	SPA Carcinegenicity	Classifications
Compound	Inhelation	0:01
scenaphthene	D	٥
inthracene	0	D
pense(a)anthracene	•2	B ₂
benge (b) fluorantheme	• 2	• ,
bease(k)fluerantheme	ס	0 ֿ
pense(q,h,i)perylene	ð	0
penso(a)pyrone	* ₂	9 2
:hrysene	•2	3 2
iibenge (a,h)anthracene	• 2	• 2
lluerenthene	ອັ	ס
fluerese	D	ɔ
indeno(1,2,3-cd)perylene	c	¢
naphthalene	D	э
phonesthrone	D	ם
py rene	b	D

^{*} Unless otherwise footnoted, classification taken from EPA (1986a).

RELATIVE POTENCY ESTIMATES DERIVED FOR POLYCYCLIC AROMATIC HYDROCARBONS
CATEGORISED IN GROUP A, B, OR C ACCORDING TO EPA'S WEIGHT OF EVIDENCE CRITERIA

Table 1

pound	Relative Potency Estimates
a) pyrone	1
alanthraceme	0.145
b)fluoranthone	0.140
•••	0.0844
o(a.h)anthracono	2.82
ne(1,2,3-cd)posylene	0.232

Source: Thorshund et. al. (1986)

liver and kidneys. In humans, the principal effects are CNS depression and liver toxicity.

Carcinogenicity and Mutagenicity

A 1977 NCI bioassay in which PERC was administered by gavage reported increased incidence of liver tumors in mice but not rats (EPA 1985d). A draft report of a NTP inhalation bioassay, currently under internal review, has noted an increased incidence of tumors in mice and rats. Although EPA has previously categorized tetrachloroethylene in Group B₂--probable human carcinogen (EPA 1985b, 1985h)--the Agency is avaiting final results of the NTP bioassay before commencing a rule-making for the chemical in drinking vater.

PERC has been evaluated for its ability to cause gene autation, chromosomal aberrations, unscheduled DNA synthesis, and mitotic recombination. In general, these responses have been weak and were observed at high concentrations that were cytotoxic (EPA 1985h). Additionally, no dose-dependent relationships were demonstrated in these studies (EPA 1985h).

Drinking Vater Standards

EPA has not established an MCL for PERC in drinking vater. The agency is scheduled to begin rule-making procedures to establish an MCL in the near future.

Carcinogenicity and Mutagenicity

Only one long-term carcinogenicity bioassay of toluene has been reported. This study concluded that toluene was not carcinogenic following inhalation in rats. NTP is conducting carcinogenicity studies in which toluene is being administered by inhalation and gavage to rats and mice. In addition, carcinogenicity studies by European investigators are expected to be published in the next few years. According to weight-of-evidence carcinogenicity criteria, EPA has classified toluene in Category D, not classifiable as to human carcinogenicity (EPA 1985c).

Toluene has not been shown to be mutagenic in in vivo or in vitro assays (EPA 1985c).

Drinking Vater Standards and Criteria

Standards. In the first stage of the rule-making process designed to establish a HCL for toluene in drinking vater, EPA has issued a proposed HCLG of 2,600 ug/L derived from the AADI of 10,100 ug/L by allocating a 20 percent of drinking vater contribution to total intake from all sources of exposure (EPA 1985c). Subsequent to finalization of the HCLG, EPA vill evaluate analytical feasibility and feasibility of control in establishing an enforceable HCL.

Criteria. In the absence of adequate dose-response data for oral exposure to toluene, EPA derived a 1-day EA, based on NOAEL of 377 mg/m³ reported in studies of humans, the subjects of single inhalation exposures of up to 8 hours. Based upon the NOAEL, an uncertainty factor of 100, and a variety of physiological parameters and intake assumptions, EPA derived 1-day EAs of 18,000 ug/L and 63,000 ug/L for a 10-kg child and 70-kg adult, respectively (EPA 1985d).

In the absence of sufficient data, EPA derived 10-day HAs of 6,000 ug/L (child) and 21,000 ug/L (adult), by applying an uncertainty factor of 3 to the 1-day HA. The Agency utilized a three-fold rather than the usual 10-fold uncertainty factor because toluene is rapidly distributed and excreted, and because the chemical presents little bioaccumulation potential relative to typical toxicants (EPA 1985d).

The EPA ambient water quality criterion for the protection of human health is 14,300 ug/L (EPA 1980a).

EPA has developed a risk reference dose (RRfD) of 0.35 mg/kg/day based upon a NOAEL of 1,365 mg/m³ reported in a study in which mice were exposed by inhalation for 14 weeks. EPA derived the RRfD by application of an uncertainty factor of 100, a 30% absorbed dose, and standard physiological parameters (EPA 1985g).

Carcinogenicity and Mutagenicity

There have been two TCA carcinogenicity bioassays. The first, conducted by NCI, was judged to be inadequate due to poor survival in treated animals. Preliminary results of the second, by NTP, showed elevated incidences of hepatocellular carcinomas. These initial results have been questioned and the study is currently being audited (EPA 1985b). Based upon these results, EPA has classified TCA according to weight-of-evidence criteria in Group D, not classifiable--inadequate human and animal evidence of carcinogenicity (EPA 1987a).

Drinking Vater Standards and Criteria

Standards. EPA has established a drinking water HCL for TCA of 200 ug/L.

Criteria. EPA has developed a 1-day HA based upon a LOEL of 1.4 g/kg/day reported in a study of rats receiving a single oral dose of TCA. Based upon the LOEL, and standard weight and intake assumptions. EPA derived a 1-day HA of 14,000 ug/L for a 10-kg child (EPA 1984d). In the absence of sufficient data, EPA has not developed a 10-day HA. EPA has developed longer-term HAs of 35,000 ug/L (child) and 125,000 ug/L (adult), based upon a NOAEL of 0.5 g/kg/day reported in a study in rats receiving TCA by gavage for 12 weeks (EPA 1985d).

The EPA lifetime EA of 200 ug/L is equivalent to and was derived by the same methodology as the RMCL (EPA 1985d).

The EPA ambient water quality criterion for TCA for the protection of human health is 18,700 ug/L (EPA 1980a).

Carcinogenicity and Mutagenicity

Six studies of the carcinogenicity of TCE in animals have been published. Two have reported significant increases in liver tumors in mice. EPA has judged three others as technically flaved. A sixth reported that TCE, containing epichlorohydrin and epoxybutane, was carcinogenic in a less responsive mouse strain, but pure TCE was not (EPA 1985b). Recognizing the lower responsiveness of the mice in the latter study, EPA has classified TCE based upon weight-of-evidence carcinogenicity guidelines in Category B2--probable human carcinogen (EPA 1987a).

Commercial TCE containing stabilizers has been reported to be veakly mutagenic in a variety of in vitro and in vivo assays representing a vide evolutionary range of organisms (EPA 1985g). Based on these data, EPA has concluded that commercial TCE may have the potential to cause weak or borderline increases above the spontaneous level of mutagenic effects in exposed human tissues (EPA 1985g).

Drinking Vater Standards

EPA has established a drinking water MCL for TCE of 5 ug/1 (EPA 1987a).

ug/g and mice receiving 14,700 ug/g. Assuming that rats weighed 9.4 kg and consumed 0.02 kg/day, NAS estimated a minimum toxic dose of 500 ng/kg/day (NAS 1982).

Carcinogenicity and Mutagenicity

Technical grade TCP was administered in the diet to male and female F344 rats and male $B_6C_3F_1$ mice at concentrations of 5,000 ug/g and 10,000 ug/g, respectively, for 105 to 107 weeks (NCI 1979 as cited in NAS 1982). Female $B_6C_3F_1$ mice received TCP at 10,000 ug/g to 20,000 ug/g, but at 38 weeks, the doses were reduced by a factor of 4 because of reduced weight gain. Under the conditions of the experiment, TCP was reported to be carcinogenic in male F344 rats (lymphomas or leukemias) and $B_6C_3F_1$ mice (hepatocellular carcinomas or adenomas) (NAS 1982). Polychlorinated dibenzofurans and dioxins may be formed during the chemical synthesis of TCP. The dioxin content of the technical grade TCP used in these studies was not reported.

Based upon the positive animal studies, EPA has categorized TCP as a B_2 , probable human carcinogen (EPA 1986a).

TCP vas not reported as mutagenic in the Ames assay with or without activation by hepatic microsomes (EPA 1984c). TCP did increase the mutation rate but not the intragenic recombination in <u>S. cervisiac</u> (EPA 1984c).

Drinking Vater Standards and Criteria

ÉPA has not developed drinking vater standards or health advisories for TCP. EPA has established ambient vater quality criteria (AVQC), based upon TCPs carcinogenicity in animals, for the protection of human health. The AVQC criteria are 1.2 ug/L for vater and fish consumption, and 3.6 ug/L for fish consumption only. These criteria are equivalent to the estimated incremental increased 1 x 10⁻⁶ lifetime cancer risk, based upon the animal carcinogenicity study results (EPA 1986g).

DATE. July 26, 1982

SUBJECT June 3, 1982 Trip Report to Dead Greek Sauget, Illinois

St Clair Co Cabo Kin/ Dend Creek

FROM: Michael C. O'Toole M/10/01/

ra: File

On June 3, 1982 at 9:00 a.m., I met Tom Powell of the Illinois Environmental Protection Agency (IEPA) at their office in Collinsville, Illinois. Tom drove me to the Dead Creek site in Cahokia, Illinois. My objective was to determine if personal safety equipment would be required for any contactor installing a chain link fence around the perimeter of the site.

Tom and I arrived at the site around 10:00 a.m. The weather was sunny warm and humid and the termperature was approximately 85°F. The creek bed is approximately 10 feet below the bottom of the existing fence. There was water in the creek but it appeared to be stagnant. Tom remarked that he had never seen that much water in the creek. The existing fence (see photographs) was down in several areas and in one location was being held down with rocks. The existing fence was in definite need of replacement.

I decided that it would be necessary to dig a hole every forty paces as close to the existing fence as possible. Tom and I would then use the HNU Photoionizer to determine if any contaminants gases were emanating from the holes. Tom and I dug 42 holes (see attached map) approximately 18-24 inches deep and 9 inches in diameter. Holes numbers 31, 32, 34 and 35 were the only ones that the HNU readout was greater than the 2 ppm Background. The readings for those holes was approximately 4 ppm. Tom was surprised that those holes showed greater than background levels. Tom conducted most of the early investigations at the Dead Creek site and he was very familiar with the locations of the heavy contamination discovered by IEPA.

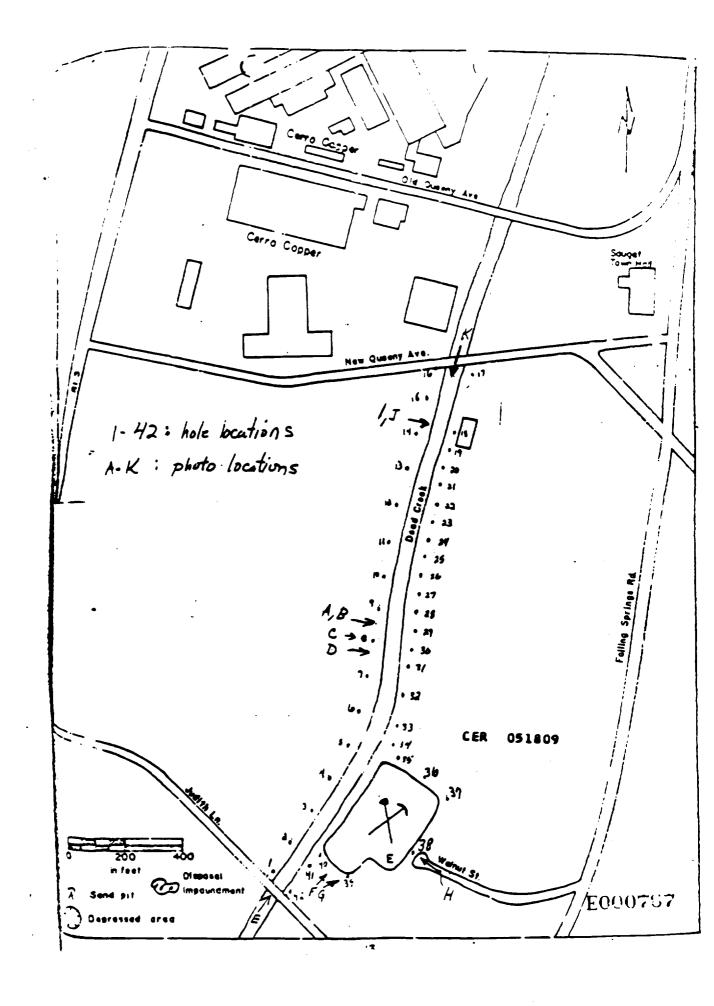
Tom and I decided that the readings from those four holes could be discounted because they were not significantly higher than background. In addition those readings were probably associated with the farming activities at that portion of the site. A soybean crop had just been planted.

Based on this field trip I decided that no personal safety equipment would be required to install the fence.

cc: Tom Powell. IEPA

CER 051808

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY	MEMORANDUM
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Sivering file DATE: 10-27.72

FROM: Information only

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FROM: Towell- southern region	E information only
SUBJECT: Genuel St. Clan Co Cakoha / Scal Com	Response requested
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January 6, 1983

Division File

Tom Powell - Southern Region

LPC - General - St. Clair County - Cahokia/Dead Creek

This office has received reports that recent heavy rainfalls have had an impact on Dead Creek. The amount of water within the creek is as high as this writer has seen since the Agency became aware of the situation in the spring of 1980.

On January 4, 1983, Tony Townsen, the Health and Safety Officer of Cahokia, contacted this office to say that water is flowing through the blocked culvert under Judith Street. Officer Townsen was concerned that water from the contaminated portions of the creek would wash contaminants downstream. Officer Townsen was told that there is little that the Agency could do to correct the situation as it now exists, but that the Agency could sample the water as it flows under Judith to see if there is a problem.

On January 5, 1983, this office received a call from Nancy Batson, 102 Walnut St., Cahokia, 618/337-4089. Hrs. Batson lives next to the borrow pit that is adjacent to Dead Creek. She stated that water is flowing into her basement at an alarming rate and that a sump pump must be operated 24 hours a day. She wondered that if perhaps some of this water could be contaminated, since a strange faint odor is noticeable at times. After a short discussion within this office, this writer contacted Hrs. Batson to say that someone would be out, later in the day, to sample the water in her basement.

This writer arrived in the area at approximately 3:00 p.m. that afternoon. A water sample was then obtained from the south side of Judith, where the blocked culvert discharged. The water level on the south side was above the culvert. Subsequently, it was impossible to estimate the flow rate. A water sample was collected, however, near an eddy on the south side. (See lab sheets) The freeboard on the north side of Judith was approximately 4-5 feet, so the likelyhood of the water running over Judith was remote. After obtaining this sample, this writer proceeded to the Batson residence to obtain a water sample from the basement. As stated previously, water was entering the basement at a substantial rate. Hrs. Batson was told that after results are received from the lab she would be notified. With the samples in hand, this writer left the site.

TEP:jlr

oc: Southern Region



2200 Churchill Road, Springfield, Illinois 62706 217/782-5562

For Immediate Release

SPRINGFIELD, ILLINOIS, SEPTEMBER 24, 1980

The Illinois Environmental Protection Agency's involvement in Cahokia's Burning Ditch (Deed Creek) was slow in developing. The Agency received initial reports from area residents in May of periodic smoldering of materials in the ditch between Queeny Avenus and Judith Lane. At that time the incident did not appear to be of a serious nature, and the Agency assigned it a low priority.

That all changed on August 27 when it was learned that Peter Laumann's dog rolled in the ditch and died of apparent chanical burns. Preliminary samples taken in the ditch revealed hazardous levels of phosphorous, heavy matals and PCB's along the half-mile of ditch between the two streets.

Subsequent soil samples taken on September 18 and 17 of soil in the litch substantiated earlier results, (see attached table). At that time water samples were taken from three private wells flus a pond adjacent and connected to the ditch.

Samples from the wells were analysed and showed normal levels of metals.

Analysis of the same wells for organic chemicals were negative for two but the well at 101 Walnut Street adjacent to the pond showed low levels of chlordans, PCB's and alkylbensenes.

Analysis of the pond water showed normal levels of metals with low levels of PCB's and aliphatic hydrocarbons which are petroleum products such as motor oil.

4

CER 051814

Contact: John Muraro

Based on the initial samples the Agency moved to seal off the ditch between the roads. Fencial and signs varning the public were placed at each end of the ditch. On September 17 the Illinois Department of Transportation, District 8, began installing a snow fence along both sides of the ditch and around the pond, sealing off the contaminated area to unauthorized personnel. This installation involved 7,000 feet of fancing from DOT stocks and was under the supervision of Dele Klohr, the district engineer. Cost of the fence is estimated at \$7,500 and will be paid for by the Illinois Emergency Services and Disaster Agency from the Governor's Disaster Relief Fund. Tests taken by the Illinois Department of Public Realth show no radioactivity in the area.

These actions complete the first phase of dealing with this situation aimed primarily at safeguarding the public's health and safety.

Phase two will concern itself with the long-term environmental impact of the contamination, its extent and assessment of the liability and responsibility for the situation.

Phase three will address the problem of cleanup and disposal.

At this time the Agency feels there is no threat from the ditch to the health and safety of the public. There are no vapors from the contamination unless the ground in the bed of the ditch is disturbed. These will be sampled later this week for laboratory analysis to determine their content.

With the public safety issue winding down the Emergency Response Unit will turn over future action by the Agency to the Division of Land Pollution Control as provided for in IEPA operating procedures. This division will develop a program to determine the extent of the pollution in the affected area as well as north and south of the area of immediate concern.

"Its primary objective will be to establish the exact perimeter of the contamination by a sampling program that includes:

- 1. east and west of the ditch from Queeny Avenue to Judith Lane.
- north and south of that area from Queeny to beyond the industrial complex and from Judith to the Mississippi River as well as both sides.
- testing vegatation along both sides of Dead Creek along the area outlined plus take samples of crops in the immediate vicinity.
- core sampling along the same route to determine the extent, if any,
 of groundwater contamination.

Land personnel will also pursue reports that a buried dump exists on a three-acre site 300 yards south of Sauget Village Hall in an area bounded by Queeny Avenue, Falling Springs Road and the northern boundary of the old Waggoner Trucking Company property.

This phase of the Agency's actions will extend over a period of several months. Unfortunately there are no quick solutions to solving problems such as those that have been found here. It will take time for these actions as well as establishing who is responsible and liable for creating this situation.

AP NO. WA 82 - HO99

Exhibit A July 8,1982 Page 1 of 3 pages

Specifications and Statement of Work

Background

Dead Creek is located in the towns of Saucet and Cahokia in St. Clair County, Illinois. The creek supplies drainage for part of the Mississippi River flood plain known as the American Bottoms. During the past forty years Dead Creek has received industrial wastes from a variety of industries including the Harold Waggoner Trucking Company, Monsanto Corporation, Hidwest Rubber Reclaiming Company, Chemical Warfare Service Division of the U.S. Army, Lewin Metals Company (now the Cerro Copper Company), American Zinc (now AMAX Zinc), LuBright Refinery (now a Mobil Oil Marketing Terminal) and Empire Disposal. A majority of these discharges were eliminated prior to 1971 when a culvert under New Queeny Avenue was plugged. These industrial wastes are now discharged to the Sauget Mastewater Treatment plant.

The creek was blocked at Judith Lane which prevented contaminated waters for being transported downstream. Concentration of several metals including barium, copper, lead, nickel, phosphorous and zinc exceeded several thousand parts per million (ppm). Polychlorinated biphenyls (10000 ppm), dichlorobenzene (12000 ppm), xylene (540 ppm), trichlorobenzene (3700 ppm), chloronitrobenzene (240 ppm), biphenyl (9000 ppm), dichlorophenol (170 ppm), alkylbenzenes (370 ppm), naphthalenes (650 ppm), and hydrocarbons (21000 ppm) were also identified in a few of the samples.

Scope of Work

The Contractor shall furnish the necessary personnel, materials, services, facilities (except as otherwise specified herein), and otherwise do all things necessary or incident to the performance of the work as set forth below:

Products

- a) Fence Chain link wire fabric shall be made of No. 9 gauge galvanized steel wire, woven in a 2 inch mesh. Top and bottom edges shall be twisted and barbed. The fabric will be one piece with a width of 72 inches.
- b) Rarbed Wire Galvanized steel wire shall consist of two strands of No. 12 1/2 gauge steel wire with four point barbs on five inch centers.
- c) Posts and Bracing Pipe line posts shall be 2" On galvanized steel pipe. School 40 par

Corner and gate posts shall be 3° 00 galvanized steel pipe.

Aracing and top rail shall be 1 - $5/8^\circ$ GD galvanized steel pipe.

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Analyses are to be performed on unfiltered samples. 'Velues exceeding no. of places shown are reported in the lab commits section; ests requested but not run should also be explained about the comments section.

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lalkalinity is to be determined as ppm of CaCO3 at pH 4.5.

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community section.		761822	E000781

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Stick-up round water sampled by (Indicate one): (1) Bailing;

?) Fumping: (3) Other (Specify) 140 temp. ere to be performed on unfiltered samples. evalues ested but not run should also be explained in the lab coments section; AZE OALL aple Appearance: 700,4 Time Collected Legal (1); Illegal (2); Indicate One: Properly preserved ----Transporus by TOTAL STATES ROLL (25) b (3) Nud-stee (3) Demotines (4) Pun-off (5) Nun-off (1) \$5,67.10 (S) Surface Mater 7 (II) Q. 6 (V. 36:369 Tella 3 11 **(** 77.11.50 DIVISION OF LANDANDTAL FE TION OF LANDANDTAL FE TION OF LANDANDTAL FE TION なら (2) Private well
(3) String
(4) Universe
(5) Public U S (1) Henttor Well (x) (x) YEL 771mts tab (x) 3 מרובנונס מעב É F SIE HASHISAN SIE Î Ĵ .ca. - 19C 30.1.30 Ê (fres 1.0.C.) (X) (5) ft. Beckground (x). . Unable to collect sample (x) salvelres ¥. Lead (Jelly) (2) Seep (3) Collection (3) Collection System (1) Fig. of MOIDE (£) 2887(E) TION ACENCY BASTA Frein A L Board Order (X)) 왕 (<u>M</u> <u>(1</u> (10; (1) भ्र ĝ č ç 2 × 9 2 3 بن 7 8 × Caco Is to be determined ¥ X SIIVOF K 7 6 X - 1880 28 17 65 Sulfate so SC (umhos/cm) Sed I wa ž Carrier Co 3 1.3.E. (. *roc) £ IJ XP'ereury Me ÷ ל און באסטסתים (עחונם) Al arranese in Xlue ? ۲ Pherolics CER 7 OIL and Crease Mitroto-oftrite TH TOWN יון בשופפלעה ויי Menine Iron 7. F] un=1 co = Hardness (aCO. 165 Y (65; 12.4.11.15 CI Diratus Cr /:et היים שי כריה 051824 C.885.07 0.0021 BISTO B 0.062 10001 20.0 F K K K 2.14 0000 000 33000 1100 IN. M D M 0

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TILLINGIS DIVIRONMENTAL TO THON AGENCY DIVISION OF LAND/MOISE PODELITION CONTROL CHEMICAL ANALYSIS FORM

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Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab corners section; tests requested but not run should also be explained to the comments section.

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Alkalinity is to be determined as ppm of CaCO3 at pH 4.5.

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Alkalinity is to be determined as 50m of Gacos at pff 4.3. EOU(755

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*Alkalinity is to be determined as ppm of CaCO3 at pH 4.5. LOCO *** E000755

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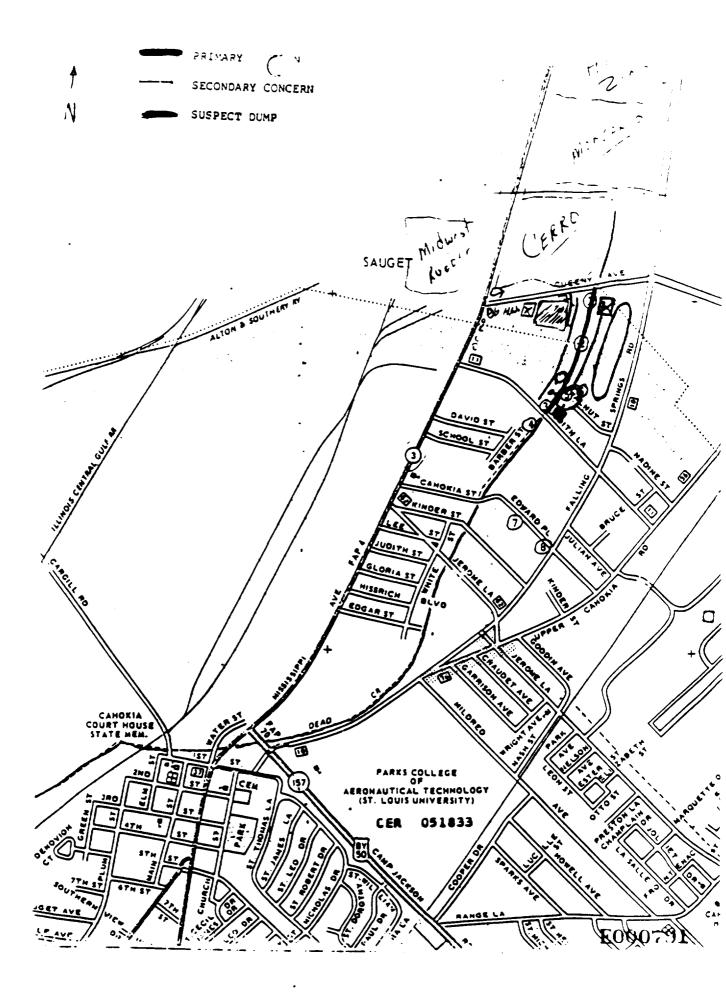
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Alkelinity is to be determined as ppm of CaCO3 at pH 4.5. E000790



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Sample Appearance: Ground water sympled by (2) Purpling: (3) Ther [miline mole (1) Belling;
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Collector comments: Removed ove Walume Kentecina by tast C. I tered 96-96 U.V. or Company

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Rec'd by Date completed Date forwarded Luce Reald ₩ ₩ CAB USE ONLY SI gra ture 8 BU47226 7 1981 198 11 88 (J) (3) (3) 162 Prime Lab (X) ASAMPE DIXARDED CO ON VALI LAB Formunts: <u>원</u> <u>8</u> 훰 실

Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

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Sulfate : Me Or (unmon/cm)

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CER 051834

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Time Collected:	11:501	1 <i>m</i>	Lab	0012734	•
Time Collected: Date Collected:	1-28-8	SPECIAL ANALYS	Date Rece	ived JAN 29	9 1581
		S ENVIRONMENTAL P		Ÿ	
	DIVISIO	N OF LAND/NOISE P	OLLUTION CONTRO		
συντή: 5 <i>/. (//</i>	DIR	FILE HEADING:	DENd Creek	FILE NUME	
SOURCE OF SAMPLE:	(Exact Locat	ion) new. to	·1.4 1511		
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TESTS REQUESTED:	P.C.B	· · · · · · · · · · · · · · · · · · ·	Chlorin	oted Hy	Idro CArbons
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DECEMBED BY: Ch		DATE		DATE	
RECEIVED BY:	ECA	COMPLETED:	3-19-51	FORWARDE	D: 3-19-81
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	55	Tab # 0012737
Date Collected: /- 3	38-81 SPECIAL ANALYSIS FOR	Date Received JAN 29 1981
•	ILLINOIS ENVIRCIMENTAL PROTECT DIVISION OF LAND/NOISE POLLUTI	
COUNTY:	FILE HEADING:	Creek GENERAL
SOURCE OF SAMPLE: (Exac	t Location) promiformy	
PHYSICAL OBSERVATIONS, RE	emarks: oclo-less-	torbid - very fast rec
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	20 / 5	
TESTS REQUESTED:	C.B. 's + C.	MORINATED Hydrocarbun
	<u> </u>	
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COLLECTED BY: TERRY MAN	IN + Tem Prival / TRANSPORTE	D BY: Perry Many
COLLECTED BY: 7 E CT V MAN	LABORATORY	DBY: Perry Mann
RECEIVED BY: C NGC	LABORATORY	DATE - 19 - 51 FORWARDED: 3 - 14 - 51
RECEIVED BY: CNGCP	LABORATORY DATE COMPLETED: 3	DATE
	LABORATORY DATE COMPLETED: 3	DATE
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RECEIVED BY: CNGCP	DATE COMPLETED: 3	DATE -19-51 FORWARDED: 3-14-51 Stureng
RECEIVED BY: CNGCP	LABORATORY DATE COMPLETED: 3	DATE -19-51 FORWARDED: 3-14-51 So Aluneur
RECEIVED BY: CNGCP	DATE COMPLETED: 3	DATE -19-51 FORWARDED: 3-14-51 Hunery RECEIVED
RECEIVED BY: CNGCP	DATE COMPLETED: 3	RECEIVED
RECEIVED BY: CNGCP	DATE COMPLETED: 3	DATE -19-51 FORWARDED: 3-17-51 SHURLEY RECEIVED
RECEIVED BY: CNGCP	DATE COMPLETED: 3	RECEIVED OUT = 5 STATE PAIRELY RECEIVED OUT = 5 381

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Time Collected:	1-28-81	SPECIAL ANALY	YSIS FORM Date R	eceived _	JAN.29-1.661	_
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WUNTY:	FI	LE HEADING:	POLLUTION CON	FILE	NUMBER:	-
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SOURCE OF SAMPLE:	(Exact Location	1 Manito	120 Well	<u> </u>	104	_
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PHYSICAL OBSERVAT	IONS, REMARKS:	<u> </u>	1055 -	tur	b/d	-
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TESTS REQUESTED:	P.C.B.	ح ک ب	Chlori	NATED	Hydrocar	ben
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COLLECTED BY: 72	ry Mand + Tem	Proval/ TRU	UNSPORTED BY:	Pirry	MANN	<i>-</i> =
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Date Collected: 1-28-81 SPECIAL ANALYSIS FORM ILLINOIS ENVIRONMENTAL MOTECTION AGENCY DIVISION OF LAND/NOISE POLLUTION CONTROL COUNTY: FILE HEADING: FILE MANBER: SOURCE OF SAMPLE: (Exact Location) MON. FORMY WELL C-103 PHYSICAL OBSERVATIONS, REMARKS: COOP / 251 - 5/19/14/1/ TUTOR CAPB COLLECTED BY: PHORY MANY - Tom Power of Transported BY: Perry Many LABORATORY	G ' - (' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	
Date Received JAN 29-1981 ILLINOIS FINVINDIMENTAL MADICATION AGENCY DIVISION OF LAND/NOISE POLLUTION CONTROL COUNTY: FILE HEADING: ST. Clare Cabe Kin Dead Creek General SOURCE OF SAMPLE: (Exact Location) Might forwarded Hydrocarb TESTS REQUESTED: PHYSICAL OBSERVATIONS, REMARKS: COLLECTED BY: Ferry Many & Tem Power L. TRANSPORTED BY: LABORATORY DATE COMPLETED: PCBS < D. 1981 RECEIVED RECEIVED RECEIVED RECEIVED RECEIVED RECEIVED RECEIVED RECEIVED RECEIVED RECEIVED RECEIVED RECEIVED	Time Collected:	DU12731
DIVISION OF LAND/NOLE POLLUTION CONTROL ST. Chir File HEADING: St. Chir Cabe No. Dend Creek General SOURCE OF SAMPLE: (Exact Location) Man. Joing well Color PHYSICAL OBSERVATIONS, REMARKS: Odorless - Slightly Force TESTS REQUESTED: P.C.B. 'S + Chlorinated Hydrocarb COLLECTED BY: First Mans - Ton Policy Transforted BY: First Mans LABORATORY DATE COMPLETED: 3-19-71 FORWARDED: 3-19- COMPLETED: 3-19-71 FORWARDED: 3-19- RECEIVED RECEIVED RECEIVED	Date Collected: 1-28-81 SPECIAL ANALYSIS FURM Date Rec	
SOURCE OF SAMPLE: (Exact Location) Mich. Horry well (2-103) PHYSICAL OBSERVATIONS, REMARKS: Odorless - Slightly Herbrod TESTS REQUESTED: P.C.B. 5 + Chlorinated Hydrocarb COLLECTED BY: Herry Mann + Tow Powell TRANSPORTED BY: Perry Mann LABORATORY DATE COMPLETED: 3-19-51 FORWARDED: 3-19- COMPLETED: 3-		
SOURCE OF SAMPLE: (Exact Location) Mich. forway well (2-103) PHYSICAL OBSERVATIONS, REMARKS: Odor less - Slightly torted TESTS REQUESTED: P.C.B.'S + Chlorimated Hydrocarb COLLECTED BY: Herry Mand + Tom Power I TRANSPORTED BY: Perry Mand LABORATORY RECEIVED BY: C.M. Giv. COMPLETED: 3-19-71 FORWARDED: 3-19- RECEIVED BY: C. M. Giv. COMPLETED: 3-19-71 FORWARDED: 3-19- RECEIVED RECEIVED	DIVISION OF LAND/NOISE POLLUTION CONTI	
PHYSICAL OBSERVATIONS, REMARKS: Odor less - Slightly Forced TESTS REQUESTED: P.C.B. 'S + Chlorinated Hydrocarb COLLECTED BY: Herry Many - Tem Parish Transported BY: Firey Many LABORATORY RECEIVED BY: C. M. G.W. DATE COMPLETED: 3-14-71 FORWARDED: 3-14- PCBs < O. Ing (2) RECEIVED RECEIVED	St. Clair Cale Kin Dend Cree	K GENERAL
PHYSICAL OBSERVATIONS, REMARKS: Odor less - Slightly Forced TESTS REQUESTED: P.C.B. S + Chlorinated Hydrocarb COLLECTED BY: Herry plans - Tom Power I TRANSPORTED BY: Force plans LABORATORY RECEIVED BY: C. M. DATE COMPLETED: 3-14-71 FORWARDED: 3-14- PCBs < O. long (2) RECEIVED RECEIVED	SOURCE OF SAMPLE: (Exact Location) now. formy well	C-103
TESTS REQUESTED: P.C.B. 'S + Chlorinated Hydrocarb COLLECTED BY: Therey Mann + Tom Power / TRANSPORTED BY: Perry Mann LABORATORY RECEIVED BY: C. C. C. C. C. C. C. C. C. C. C. C. C.		
TESTS REQUESTED: P.C.B. 'S + Chlorinated Hydrocarb COLLECTED BY: Therey Mann + Tom Power / TRANSPORTED BY: Perry Mann LABORATORY RECEIVED BY: C. C. C. C. C. C. C. C. C. C. C. C. C.		
TESTS REQUESTED: P.C.B. 'S + Chlorinated Hydrocarb COLLECTED BY: Therey Mann + Tom Power / TRANSPORTED BY: Perry Mann LABORATORY RECEIVED BY: C. C. C. C. C. C. C. C. C. C. C. C. C.	PHYSICAL OBSERVATIONS, REMARKS: COOP / 55 - 5	lightly turbed
COLLECTED BY: FELLY MANN + Tem Power / TRANSPORTED BY: FELLY MANN LABORATORY DATE COMPLETED: 3-19-51 FORWARDED: 3-19- PCBs < 0.1 mg (2) RECEIVED RECEIVED		
COLLECTED BY: PECRY MANN + Tom Power / TRANSPORTED BY: PERRY MANN LABORATORY DATE COMPLETED: 3-19-51 FORWARDED: 3-19- PCBs < 0.1 g (8) RECEIVED RECEIVED		
COLLECTED BY: PECRY MANN + Tom Power / TRANSPORTED BY: PERRY MANN LABORATORY DATE COMPLETED: 3-19-51 FORWARDED: 3-19- PCBs < 0.1 g (8) RECEIVED RECEIVED	•	
COLLECTED BY: PECRY MANN + Tom Power / TRANSPORTED BY: PERRY MANN LABORATORY DATE COMPLETED: 3-19-51 FORWARDED: 3-19- PCBs < 0.1 g (8) RECEIVED RECEIVED	TESTS REQUESTED: PCB'S + Chloci	vated Hudencarhon
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RECEIVED BY: CMC COMPLETED: 3-19-51 FORWARDED: 3-19-51 PORWARDED: 3-19	COLLECTED BY: PECRY MANN + Tem Power 1 TRANSPORTED BY:	TUPEN MANN
PCBs < 0.1 g/s RECEIVED BY: C'GEV COMPLETED: 3-19-71 FORWARDED: 3-19-		
PCBs < 0.1 glb RECEIVED	BECEIVED BY: CMCCC COMPLETED: 3-16	DATE S. FORWARDED: 7-19-51
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Time Collected: 11:5	AM -	inb &	U 12730	
Date Collected: 1-28	91 SPECIAL ANALYSIS	FUITA	ed JAN 29 19	781.
	NOIS ENVIRONMENTAL PROS SION OF LAND/NOISE POLI			
COUNTY:	FILE HEADING: CAMOKIA DE		FILE NUMBER:	
SOURCE OF SAMPLE: (Exact Lo	cation) Mon. forcing	well G	- 102	
PHYSICAL OBSERVATIONS, REMAR	ks: Octorless	- tur	bid	
	0'5	011 .		
TESTS REQUESTED: 7. C.	B. 's +	CALORINAT	Ed Hydi	<u>0 (Arb</u> ens
COLLECTED BY: 72 MANN +		RIED BY:	cry Mann	
	LABORATORY		DATE	
RECEIVED BY: CA ELF	COMPLETED:	3-19-81	FORWARDED:	3-19-81
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	Time Collected:
	Date Collected: 1-28-31 SPECIAL ANALYSIS FORM Date ReceivedJAN 29 1981
	ILLINOIS ENVIRONMENTAL PROTECTION AGENCY DIVISION OF LAND/NOISE POLLUTION CONTROL
	St. Clair Colo. Kin Dend Corek GENERAL
	SOURCE OF SAMPLE: (Exact Location) NELL G-101
	PHYSICAL OBSERVATIONS, REMARKS: dirless - slightly turbed
	TESTS REQUESTED: P.C.B.'S + Chlorinated Hydrocarbons
	COLLECTED BY: TECH MANN + Tom Power Transported BY: Time Mann
	RECEIVED BY: CRECO COMPLETED: 3-19-8/FORWARDED: 3-14-8/
-	PCBa = 0,22 mg/2
	22 (18)
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	OCT 15 1981
-	RECEIVED OCT 15 1981 ILL. E.P.A D.L.P.C. STATE OF ILLINOIS
	CER 051840
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Date Collected:	2:05pm 1-28-81	SPECIAL ANALYSIS	S FURM Date Rece	cived JAN	29 1981
		ENVIROUMENTAL PR			
		OF LAND/NOISE POL		OL	
COUNTY:		ILE HEADING:	10	FILE NUI	ABER:
<u>-5+.0/</u>	MR	CareKin D.	end Creek	(727)	icn/-
SOURCE OF SAMPLE	: (Exact Location	n) samplex	-/ wasco.	Heeter Fo	oma
Pield for	oma point	6100 de	west of 6	108	
				 	
PHYSICAL OBSERVA	TIONS, REMARKS:	sample is a	s/udge /i	Le oily-	to like
Suls House	havine as	in line tra	dor	•	
		7			
					
TESTS REQUESTED:	P.C.B.	5 .4	Chlorin	pled H	Jetro carbe
			 		
COLLECTED BY: 7-	Try MANN + Tom	Paule / TRANSF	ORIED BY:	Perry N	10 × ×
	7	LABORATORY			
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Time Collected:	2.10 pm	CRUCTAT AVA	tab 🖟	001 2 7	<u>"</u> 3
Time Collected:	1-28-31	SPECLAL ANA	Date R	ccived	189.1. 95 NAI
			L PHOTECTION AGE	HCY	
CAUNTY	DIVISION	OF LAND/NOIS	E POLLUTION CONT	rPOL	
COUNTY:	1	FILE HEADING:	Dend Cre		HUMBER:
SOURCE OF SAMPLE:					
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collected		J			
DINETCAL ORGERVATI	TONE DEPTH DRE	<i>c.</i> /	//		11
PHYSICAL OBSERVATI	UNS, REMARKS:	·	generally a	gars	row
LAN COM TRA	ented top	:501/.			
					
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TESTS REQUESTED:	P.C.B.	ر ک	+ Chlas	:under/	Hydrocarbo
TENTS REQUESTED.	<u>,, c. o.</u>		CIIICKI	NA IEC	TIYOTO CAPEL
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Time Collected: 3:15 PM	Iab 10012776
Time Collected: 3:15 Pm Date Collected: 1-28-81 SPECIAL ANALYSIS FO	Date Received JAN 29 1381
ILLINOIS ENVIRONMENTAL PHOTEC DIVISION OF LAND/NOISE POLLUT FILE HEADING: 57. Clair Calartia Description	
SOURCE OF SAMPLE: (Exact Location) 5-50	
the worth food at the	Northern End of
the North fond at the Cerro Copper's property,	Adjacent to Michiganto's
PHYSICAL OBSERVATIONS, REMARKS: Bright Brown	UNISH -CEANUE
color, oil filmon.	surther, strong
organic e der.	
TESTS REQUESTED: P.C.B.'s + C	7/1 · / / // /
TESTS REQUESTED: P.C.B. 7	Phlorinated Hydrocarbon
COLLECTED BY: TERRY MANN + Tem Power / TRANSPORT	ED BY: Firey Mann
LABORATORY	
RECEIVED BY: CMC 6:17 COMPLETED: 3	DATE -19-81 FORWARDED: 3-19-8
PCBs < 0. Jug	7/2
4 19	RECEIVED
	OCT 1 5 1381
	STATE OF ILLINOIS
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Time Collected: 3:00	SPECIAL ANALY	ULI Kant	12725
Date Collected: /- 2	8-91 SPECIAL MARLE		ved JAN 29 1581
	LLINOIS ENVIRONIENTAL		
COUNTY:	IVISION OF LAND/NOISE :	/ / /	FILE NUMBER:
_St. Clair	Calockia /	Dend Creek	GENERAL
SOURCE OF SAMPLE: (Exact			<i></i>
the south power	I at the south a	ed located	on Carro's p
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DUVETCAL OBSERVATIONS DE	MARKS.		4 1 2
PHYSICAL OBSERVATIONS, RET	Willia: green/3h	gray color u	11 PA 5/1947
adordet estal.			
			<u></u>
			
TESTS REQUESTED: P	C.B. 'S +	Chlorina	ted Hydroc
			
COLLECTED BY: 12 rry 111000	+ Tom Powell TRA	ISPORTED BY:	ery Mann
COLLECTED BY: 12 rry 111000	LABORATOR		
	LABORATOS DATE	NY .	DATE
RECEIVED BY: 12 CM	LABORATOS DATE		DATE FORWARDED: 3
RECEIVED BY: C MICO	LABORATOR DATE COMPLETED:	NY .	DATE FORWARDED: 3
	LABORATOS DATE	NY .	DATE FORWARDED: 3
RECEIVED BY: C MICO	DATE COMPLETED:	3-19-81	DATE FORWARDED: 3
RECEIVED BY: C MICO	DATE COMPLETED:	3-19-81	DATE FORWARDED: 3
RECEIVED BY: C MICO	DATE COMPLETED:	3-19-81	DATE FORWARDED: 3
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RECEIVED BY: C MICO	DATE COMPLETED:	18 3-19-51	DATE FORWARDED: 3 RECEIVED OCT 1 5 1981 L. E.P.A D.L.P. STATE OF ILLINOIS

$\mathcal{G}^{\prime\prime}$	(2 7	10-,+	v (
Time Collected: 2.	<u> </u>			0012740	
Date Collected: /-	3 3 - 31 SPECIAL	ANALYSIS FO	Date Rece	ived JAN 29	1381
•	ILLINGIS ENVIRONME DIVISION OF LAND/				
COUNTY:	FILE HEAD	ING:		FILE NUMBER	:
St. Clair	Car.K.	10/1/00	1 Crick	GENE!	1/-
SOURCE OF SAMPLE: (Exa	ct Location) mo	N. toring	well	<u> G-11.2</u>)
		· · · · · · · · · · · · · · · · · · ·			
	_				
		lor loss	i	• , / .	
PHYSICAL CBSERVATIONS,	REMARKS: C. 070	CF 1PSS	<u> </u>	ght oryn	uic oden
	·	· · · · · · · · · · · · · · · · · · ·			
	-			 	
TESTS REQUESTED:	OCB. 'S	+ (7 hlacin	ted Hy	Longacher
twis regulater. /	· C. D.		11/02/201	176 1196	NO CAPOLO
					
COLLECTED BY: 12 cry Me	AND + Tom Powel	/ TRANSPORT	ED BY:	reer Man	~
		ORATORY			
RECEIVED BY: CM GO	DATE	ED: 3-19-	<i>5 </i>	DATE	3-19-51
RECEIVED BI: O (201	COMPLETE	<u>υ: 3·17·</u>		POR ARDED:	3-19-81 Je Hundery
			<u></u>		
	< 0.1 mg/e			. 4 0.1	
Chlurobe	TIPME - 2			35	
Chloruani	line = 2	my/e	(PPb)	21	PPB
			1	RECEIV	ED
				OCT 1 5 199	
				L. E.P.A D	II BO
				STATE OF ILL	NOIS
				CER 05	1845
LPC-8A 4/77	(NOT FOR D	ATA PROCESSI	ing)	F	000803
•••	(-	DU1:	

PCB2 < 0.		10.	CER 0518	46
PC132 < 0.		, 0.		
PC132 < 0.		, 0.		
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PC132 < 0.	·	, 0.		
PC132 < 0.	·			
PC 132 < 0.	~			
Den.	1 mg/e			
RECEIVED BY:	COMPLETE	D: 3-14-E	FORWARDED:	3-14-81 Hureny
RECEIVED BY: C K.S.	DATE	ORATORY	DATE	
COLLECTED BY: TErry MAN	w + Tem Power	/ TRANSPORTED BY:	Pirry Mana	<u> </u>
	· .			
TESTS REQUESTED:	C.B. 's	+ Chlor	inated Hyd	rocarbens
				
				
PHYSICAL OBSERVATIONS, RE	DMARKS: 5/1947/	y turbed,	slight www.	entainble
			<i>i</i>	
SOURCE OF SAMPLE: (Exact	t Location) May	A / WEAR C.C.	1/ (2-11/	
COUNTY	FILE HEADI	HOISE POLLUTION CON	FILE NUMBER	
		ENTAL PROTECTION AC	GENCY	
. <u> </u>			ICCGIVEU	-
Time Collected: 1.4 Date Collected: 1-5	38-91 SPECIAL	AMALYSIS FORM Date I	JAN 29	1931

D012779

Time Collected:	J.D. FM	,	ל לר ו	JUL 27:8	
Time Collected:	1-28-31	SPECIAL AMAL	1818 FORM Onte Red	ceived _JAN 29_1	1 81- —
•			PROTECTION AGES POLLUTION CONTE		
57, C/A	r'	ILE HEADING:	7	FILE NUMBER:	1/
SOURCE OF SAMPLE:	(Exact Location	a) Monit	sring WEIL	C-110	
					
PHYSICAL OBSERVAT	IONS, REMARKS: <	lightly	turbid.	slight ory	nicodor
	•				
TESTS REQUESTED:	P.C.B.	's . ₊	Chloria	valed Hyd	ro carbins
COLLECTED BY: 7200	ry Mann + Tom	True / TRA		Pirry Mana	
RECEIVED BY:	nc Eip	DATE COMPLETED:	3-14-81	DATE FORWARDED:	3-14-81 = Hursey
PCB	< 0.i m	2/8		.:	
		/	<u> </u>	000)	
			401		
				CER 051	1847
				RECEIVED	
			IL <u>L</u> S	TATE OF ILLINOIS	e
LPC-8A 4/27	(N(OT FOR DATA R	POCESSING)	F	200805

DU127: 8

	richic
Time Collected: /:20	DM ab 1-
Date Collected: 1-28.	SPECIAL ANALYSIS FORM Onte Received JAN 29 1981
	NOIS ENVIRONMENTAL PROTECTION AGENCY SIGN OF LAND/NOISE POLLUTION CONTROL
COUNTY:	FILE HEADING: _ FILE NOWER:
_St. Clair	CapeKin Dand Creek GEKERAL
SOURCE OF SAMPLE: (Exact Loc	eation) Frigultoring well (2/09
	<u> </u>
	
PHYSICAL OBSERVATIONS, REMARK	s: light green ocher strong crannic
	
	· · · · · · · · · · · · · · · · · · ·
TESTS REQUESTED: PC	B.'s + Chlorinated Hydrocarbin
 	
COLLECTED BY: 7 Erry MANN F	Tom Power / TRANSPORTED BY: Perry Mann
· · · · · · · · · · · · · · · · · · ·	LABORATORY
RECEIVED BY: CM ECIP	DATE COMPLETED: 3-19-51 FORWARDED: 3-19-51
FUE CO	Sel 10-, L.
Chlorubenzenes	
	L 0.1 AB
· · · · · · · · · · · · · · · · · · ·	CER 051848
	RECEIVE
	CEIVED
	06115:731
	11 P 🛌 .
	RECEIVED OCT 1 5:331 ILL. E.P.A D.L.P.C. STATE OF ILLINOIS

time Collected: 2:15	· + - 1	0 / 1 / Y (1 · · · • OF	2.0
Time Collected: 2.75	1-m	lab #	UU127	
ate Collected: 1-28	g SPECIAL ANA	Date R	cceived JA	N 29 1981
	INCIS ENVIRONEENTA			
SUNTY: -5+. Clair	FILE HEADING:	Dend Cre	FILE M	MUSER:
OURCE OF SAMPLE: (Exact Lo		itoring w.		
		J		
				
HYSICAL CBSERVATIONS, REMAR	exs: es cole	reless.	slight o	rgou.codo
				<i></i>
				· · · · · ·
ESTS REQUESTED: PC	B'5 7	- Chine	insted	4 No carb
ESTS REQUESTED: P.C	B. 's 7	- Chlor	insted	4 y drocarb
ests requested: P.C	B. '5 7	Chlor	insted !	ydrocarb
		 		
DLLECTED BY: Perry Many		Ransported by:	insted !	
OLLECTED BY: PErry Mand	r To∼ rowell II Laborat Date	Fansported by:	<i>Përry</i> DATE	NONN.
OLLECTED BY: PErry Mand	r Tom Power 1	Ransported by:	<i>Përry</i> DATE	
CCEIVED BY: CMC-FLP	r To∞ Powell The Laborat Date Completed:	Fansported by:	<i>Përry</i> DATE	NONN.
OLLECTED BY: PErry Mand	r To∞ Powell The Laborat Date Completed:	Fansported by:	<i>Përry</i> DATE	NONN.
CCEIVED BY: CMC-FLP	LABORAT DATE COMPLETED:	PANSPORTED BY:	DATE FORWAR	NONN.
CCEIVED BY: CMC-FLP	r To∞ Powell The Laborat Date Completed:	PANSPORTED BY: FORY	DATE FORWAR	NONN.
CEIVED BY: CMC-FLP	DATE COMPLETED:	PANSPORTED BY:	DATE FORWAR	DED: 3-19-
CCEIVED BY: CMC-FLP	DATE COMPLETED:	PANSPORTED BY:	DATE FORWAR	DED: 3-19-
CCEIVED BY: CMC-FLP	DATE COMPLETED:	PANSPORTED BY:	DATE FORWAR	DED: 3-19-
CCEIVED BY: CMC-FLP	DATE COMPLETED:	PANSPORTED BY:	DATE FORWAR	DED: 3-19-
CCEIVED BY: CMC-FLP	DATE COMPLETED:	CANSPORTED BY:	DATE FORWAR	DED: 3-19-

(10') Time Collected: 18:16	· Fire	nity:		
Time Collected: 18:10	ofm -	lab #	0012735	
Date Collected: /- 2	3-91 SPECIAL ANALYS.	IS FURM Date Reco	cived JAN 29 138	Í
DI	LINOIS ENVIRONMENTAL PR VISION OF LAND/NOISE PO		DL .	
COUNTY: _St. Clair	FILE HEADING:	Dend Creek	FILE NUMBER:	<u>/</u>
SOURCE OF SAMPLE: (Exact)	Location) Monten	in WELL	G.107	
		· · · · · · · · · · · · · · · · · · ·		
			/	,
PHYSICAL OBSERVATIONS, REMA	IRKS: Viry 70-0	vd - 57	LONG DIGANIC	codor
	•			
TESTS REQUESTED: P. C	1B's +	Chlorin	pled Hydro	carbine
	•.		,	
			 	
COLLECTED BY: FERRY MANN			PERRY MANN	
· · · · · · · · · · · · · · · · · · ·	LABORATORY	· · · · · · · · · · · · · · · · · · ·	DATE	
RECEIVED BY: CM FLY	COMPLETED:	3-19	-SYFORWARDED: 3	19-81
			<i>> 1</i>	Junery
PCBa	= 0.3 mg/2	12 (PPb)	. 0.4	PCB
Chloroben	zene = 63 4	ugle (PPb) 63	prb
Chloroanili	1 = 90 m	1/e	90	PPB
Dichlorophe	no = 90 m	ug/i	<u>560</u>	PPB
			CER	051850
		R	CEIVED	
			CT 1.5 1981	
		ILL. E	PA - DIPC	
		STAT	PA - DI PC	
* DC 84 //35	(VOS. DC. DAS. T.C.	arcatuc)		E000805

	suuse.
Time Collected: 1:34P.M. Lat	D0201:
SPECIAL ANALYSIS FORM	e Received MAR 11 3
DIVISION OF LAND/NOISE POLLUTION	
COUNTY: FIRE BEADING:	CREEK FILE NUMBER:
SOURCE OF SAMPLE: (Exact Location)	·
G-11/(1	MONITOR U
PHYSICAL OBSERVATIONS, ROMARES; REMOVED U	Pre Voune
BAILED 2 RTI.	
TESTS REQUESTED: PCB - CLORINATE	HYDROCA
	Teres per justice
COLLECTED BY KEY POSIE & DONE TOWNSFORTED LABORATORY	Mandage & Do
RECEIVED BY: CMC COMPLETED:	DATE FORMARDED:
	9
Pets < 0.1 mg/R	
	
RECEIVED	RECEIVED
MAY 2 1 1981	RECEIVED APR 29 1981
	E.P.A D.L.P.C.
MAY 2 1 1981 ILL. E.P.A. – D.L.P.C.	
ILL. E.P.A. – D.L.P.C. STATE OF ILLINOIS	E.P.A. — D.L.P.C. STATE OF ILLINOIS
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Time Collected: 2	15 PM	Lab #	0
2	-10-81 SPECIAL ANALYS	IS FORM	MAR II 1991
Date Collected:	-10-8	IS FORM Date Received	11.11/ 11 1.701
	HALLNOIS ENVIRONMENTAL P		
COUNTY:	DIVISION OF LAND/NOISE P		MAS NOVEDER:
ST. CLA	IR CAHOKINDO	SAD CREEK	
SOURCE OF SAMPLE: (E	Exact Location)		
	G110 (1	MANITON 11	(ku)
	2110		THE CONTRACTOR OF THE CONTRACT
			
PHYSICAL OBSERVATIONS	, REMARKS: REMOVED	ONE VOU	VME_
BAICA	0 2 Bri		
DAICA			
1	CB - Cloren	agen Hun	20000000
TESTS REQUESTED:	CD - COUNT	eletek pen u	TOCHROUNS
		election in	there of
,,	$\sim 10^{-1}$	R 1	24
COLLECTED BY:	DIE TUOVE OLANTRIN	SPORTED BY:	SHE TOUR TOUR
_	LABORATOR	Y	
RECEIVED BY: M	DATE COMPLETED:		PORWARDED: 4/2E/F/
RECEIVED BI.	· OCE METED.		Alundary
			<i>y</i>
	926 0.9 mg/R		
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	- RECEIVED		
		RECEIVED	
	MAY 2 1 1331	APR 29 1981	
	III FPA - DI PC		
	STATE OF ILLINOIS	E.Y.A. — D.L.Y.C.	
		STATE OF ILLINOIS	D020138
			CER 051852
LPC-8A 4/77	(NOT FOR DATA PRO	CESSING)	
			E000810

~ ⁶⁹		D020137
Time Collected: 8:32	A.M. La	ከ #
Date Collected: 3-/1-	SPECIAL ANALYSIS FORM De	MAR 198
	NOIS ENVIRONMENTAL PROTECTIO	N AGENCY
DIVI	STON OF TAND/NOTSE POTTIETON	CONTRACT
ST. CLAIR	CAHOKIA/DEAD	CREEK FILE NUMBER:
SOURCE OF SAMPLE: (Exact Lo	cation)	
	G-109/Ma	NITOR WELL)
		WELL .
PHYSICAL OBSERVATIONS, REMAR	ES: VERY STRONG	- Opac - DIRTY
	WE VOLUME 3	
80160	2 871.	
DAGO	A 0/1/-	
TESTS REQUESTED: PC	3 - CLORINATE	ED HYDROCARBONS
	delita	permitted to
	makin	DLP
COLLECTED BY: KEY BOLLS +1	DUE TOLAN TRANSPORTED	- V
COLLEGIST STREET DOOLS 4	LABORATORY	- MANUAL TOUR TOUR
- 4 (4	DI Ay E	DATE
RECEIVED BY: CANC	COMPLETED:	FORWARDED: 4/2F/F/
		S Nun
Fels	50.1 11-11	
	x 0.1 45/h	
		
	DECENTED -	CER 051853
	RECEIVED	DEAGUED
	MAY 2 1 1331	RECEIVED
	ILL. E.P.A D.L.P.C. STATE OF ILLINOIS	APR 29 1981
		E.P.A. — D.L.P.C.
		STATE OF ILLINOIS

	FURM	0020136
Nime Collected: 12	SPECIAL ANALYSIS FORM	MAR 11 1981
Date Collected:	-/0-8/	te Received
	ILLINOIS ENVIRONMENTAL PROTECTION DIVISION OF LAND/NOISE POLLUTION	
COUNTY:	FILE HEADING:/	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD C	reek
SOURCE OF SAMPLE: (Ex		
	G-108 (Man)	rox WELL)
DUVETONI ODERDUNTIONS	DOMEST PENNISS DA	e Varia
RALL OBSERVATIONS,	REMARKS: REMOVED ON	E VOLUME
DAILED	ONE QT.	
	· · · · · · · · · · · · · · · · · · ·	
		
tests requested: ${\cal F}$	PCB	
· · · · · · · · · · · · · · · · · · ·	2100	
COLLECTED BY: EN BO	SIE TOUT TOLAN TRUNSPORTED	M: Key BOSE & DONE TOLAN
	LABORATORY	
RECEIVED BY:	DATE COMPLETED:	PORMARDED: 4//25
		Silvi
Qu j	S TO i	<u> </u>
747	5 < 0.1 mg/2	
	RECEIVED	RECEIVED
	MAY 2 1 1981	
		APR 29 1981
	ILL. E.P.A D.L.P.C.	
	ILL. E.P.A D.L.P.C. STATE OF ILLINOIS	E.F.A D.E.F.C.
	ILL. E.P.A. – D.L.P.C. STATE OF ILLINOIS	E.P.A. — U.L.P.C. STATE OF ILLINOIS
	ILL. E.P.A. – D.L.P.C. STATE OF ILLINOIS	
LPC-8A 4/77	ILL. E.P.A. — D.L.P.G. STATE OF ILLINOIS (NOT FOR DATA PROCESSING)	STATE OF ILLINOIS CER 051854

		C 0020135
. 4	.59 P.M. -10-81 SPECIAL ANALY	
Mime Collected:	SPECTAL ANALY	Lab #
Date Collected: 3-	- 10 - 8 S. W. W.	Date Received MAR 1 1981
	HAANOIS ENVIRONMENTAL	
	DIVISION OF LAND/NOISE	POLLUTION CONTROL
ST. CLAIR	PILE HEADING:	DEAD CREEK FILE NUMBER:
31. CLAIR	CAHOKIN	JENO CREEK
SOURCE OF SAMPLE: (E	xact Location)	
	G 107	(MONITOR WELL)
		(TOTAL WELL)
	···	
DUVOTOAT ABGYDUATIANG	, REMARKS: DIRTY	STRONG DOOR
KEMO	NED ONE VO BAILED 2	LYME
	BAILED 2	Q13.
	000	
TESTS REQUESTED:	PCB + CA	OKINATED HYDROCARBONS
		deletel per instruction
COLLECTED BY: FA	ove + Days Town	DEPORTED HE: KEN BOLK & DOUG TOLA
COLLECTED BI: PAY		
	LABORATO	
RECEIVED BY: CMC	DATE COMPLETED:	PORWARDED: 4//11/71
		Q Hinley
	<i>!</i> ' :	
	10B 0.37 14	12
	<i>.</i> • •	
		
	RECEIVED	
	MAY 2 1 1981	RECEIVED
	ILL. E.P.A D.L.P	.C.
	STATE OF ILLINOIS	APR 29 1981
- 		E.P.A D.L.P.C.
		STATE OF ILLINOIS
		CER 051855
LPC-8A 4/77	(NOT FOR DATA PI	DO 2 0135

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· •	(20124
Time Collected: 5:15 P.M.	20134
Date Collected: 3-10-8/ SPECIAL ANALYSIS	Porte Received MAR 1 1981
ILLINOIS ENVIRONMENTAL PROT	
DIVISION OF LAND/NOISE POLL COUNTY: FILE HEADING:	FILE NUMBER:
ST. CLAIR CAHOKIA/DO	AD CREEK
SOURCE OF SAMPLE: (Exact Location)	
G106	MONTOR WELL
DEVETCAL ORSEDVATIONS DEMANES. D	CTONE () DON
PHYSICAL OBSERVATIONS, REMARKS: DIRTY &	SIRVING, UDUR
	· ume
BAILED 2 C	¥73 ·
TESTS REQUESTED: PCB - CLO	RINATED HYDROCARENS
	eleted per instruction
	of the stiffer Dipe
COLLECTED BY: KEN BOLLS & Dry TORAN TRANSPO	RIED BI: KEN BOSIE & DOUG TOLD
LABORATORY	
RECEIVED BY: CMC COMPLETED:	DATE FORWARDED: 4/28/8
RECEIVED BI. O. V. C. COMPILIED:	Solument 4720/8
PeB a. 4 10 1R	
RECEIVED	
MAY 2 1 1981	RECEIVED
ILL. E.P.A D.L.P.C	
STATE OF ILLINOIS	APR 29 1981
	E.P.A. — D.L.M.C. STATE OF ILLINOIS
	STATE OF ILLINOIS
LPC-8A 4/77 (NOT FOR DATA PROCES	CER 051856

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Time Collected:	P.M.	Lab #		
Date Collected: 3 -/	0-81 SPECIAL ANALYSIS	FORM Date Received	1117981	
	ILLINOIS ENVIRONMENTAL PHOT DIVISION OF LAND/NOISE POLL	UTION CONTROL		
ST, CLAIR	CAHOKA /DI	EAD CAGE	OMBER:	
		THE CREEK		
SOURCE OF SAMPLE: (Exac	t Location)		, 	
	G 105 M	DONITOR (N	Ece)	
MINOTOLY ORGANIZATIONS IN	Presidente	Due theune		
PHISICAL OBSERVATIONS, R	DUARES: REMOVED	INE YULUME		
BAILED			 	
······································			·	
	CR			-
TESTS REQUESTED:	<u></u>			
				
COTT BOTTON BY West BOTTON	e + Down Town Du	PC BUILDING	- 12	LAC
WITEGIED BLIKEN DIN	LABORATORY	RILD BI:KEN DAIR	T DIOT	10cm
	DIAME	D'\$v.		/ /
RECEIVED BY: CMC	COMPLETED:	FORM	RDED: 4/	25/87
				<u> Hulu</u>
A	6 < 0.1 m/L			
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	DECENTED.			
	RECEIVED			
	MAY 2 1 1981	RECEIVED		
	ILL. E.P.A D.L.P.C.	ADD 0.0 1001		
	STATE OF ILLINOIS		CER	051857
		STATE OF HILLIAND		
		STATE OF ILLINOIS		
LPC-8A 4/77	(NOT FOR DATA PROCE	ssing) D(120	0133	
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Time Collected:	4.200	. Aa	(DU2	0432	
			Lab #	MACO	1.7.00#	
Date Collected:	3-10-8		Date R	eceived MAR	1 1781.	
		S ENVIRONMENTAL N OF LAND/NOISE				
ST. CO		CAHOKIA/	DENO CAE	FINE NO	VBER:	
SOURCE OF SAMPLE	: (Exact Locat	ion)	<u></u>			
	G	104 (MONITO	R WE	(C)	
PHYSICAL OBSERVA	TIONS, REMARKS:	REMOVE OT.	DO ONE	Vocum	E	
TESTS REQUESTED:	PC	B				
COLLECTED BY:	N BOUL	DOVE TOUR		MOUS .	Da	ETOLAN
	<u> </u>	DATE		DATE	4/	7 /
RECEIVED BY:		COMPLETED:	11 0	FORMAR	DED: 7/	25/47
	12 K		Muly			
	/ (F.)	0.12 14	/			
		RECEIVED				
		MAY 2 1 1981	RE	CFIVED		
		. E.P.A. – D.L.I	is AP	R 29 1981	CER	051858
			STATE	OF ILLINOIS		
LPC-8A 4/77		(NOT FOR DATA F		D02013		0008±6

	(b0 2 0131
Mme Collected: 5:	26 P.M. Lab #	
Date Collected: 3 -	10-81 SPECIAL ANALYSIS FORM Date	Received MAR 11 1981
	ILLAINOIS ENVIRONMENTAL PROTECTION A	
	DEVICED OF LAND MOTOR POLLIFTON CO	MEDOL
ST. CLAIR	CAHOKIA DEAD (RESK FILE NUMBER:
SOURCE OF SAMPLE: (Exa		
	G- 103 MONIS	rox (1/611)
	O JOS CIJORII	or wear
	9. 04	/
	REMARKS: REMOVED ONE V	OCUME
BAILED	101.	
THE TE THOUTESTED.	DCB	
TESTS REQUESTED:		
	DI PC	Dipo
COLLECTED BY: VEN BY	SIE TOUR TOWNTHANSPORTED BY:	V 1 0 -
	LABORATORY	
RECEIVED BY: CMC	DATE COMPLETED:	PATE FORWARDED: 4/25/7
		Stinle
	Heb 1 2 1 1 18	
	Feb < 0.1 wyll	
	DECENTED.	D -
	RECEIVED	RECEIVED
	MAY 2 1 1981	RECEIVED APR 29 1981
•	ILL. E.P.A D.L.P.C.	F P A
	STATE OF ILLINOIS	STATE OF ILLINOIS
		CER 051859
LPC-8A 4/77	(NOT FOR DATA PROCESSING)	D0 2 0131

((00 20130
Nime Collected: 3:5	<u>DP.M.</u> Lab	
Date Collected: 3-10		Received MAR II 1981
	LINOIS ENVIRONMENTAL PROTECTION	
COMPLETY.	VISION OF LAND/NOISE POLLUTION CO	FILE NUMBER:
ST. CLAIR	CAHOKIA/DEAD CA	EEK
SOURCE OF SAMPLE: (Exact		
	G 102 (NION	VITOR WELL)
PHYSICAL OBSERVATIONS, REM	ARES: REMOVED ONE	Voume
	D ONE QT.	T Dear NE
Brite	UNIC OT	
	<u> </u>	
TESTS REQUESTED: P	CB	··· ·······
	in DUC	W B DLPC
COLLECTED BY: FN BOSI	LABORATORY	HEN DWE T LOUG TOLA,
	DATE	DATE // -/ -/
RECEIVED BY: CMC	COMPLETED:	FORWARDED: 4/28/9/
		Je princip
- AB	o. It my the	
	· · · · · · · · · · · · · · · · · · ·	
	RECEIVED	
	MAY 2 1 1981	
	ILL E.P.A D.L.P.C. STATE OF ILLINOIS	RECEIVED
	STATE OF ILLINOIS	
		APR 29_1981
		STATE OF ILLINOIS
		THE OF ILLINOIS
LPC-8A 4/77	(NOT FOR DATA PROCESSING)	0020130

CER 051860

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LPC-8A 4/77	(NOT FOR DATA PROCESSING)	CER 051861
		E.P.A. — D.L.P.C. STATE OF ILLINOIS
	ILL, E.P.A D.L.P.C. STATE OF ILLINOIS	APR 29 1981
	MAY 2 1 1981	RECEIVED
	RECEIVED	
fe.	B 0.13 m/l	
RECEIVED BY: CMC	COLFLETED:	FORWARDED: 4/28/8/
COLLEGIED BY: (A) DOSIE	LABORATORY DATE	CKEN BOSTE & DOULTOLGA
	- DIPC	DLPC
TESTS REQUESTED: PC	CB	
	BAILED	
PHYSICAL OBSERVATIONS, REM	HERES: REMOVED C	WE VOLUME
	G101 (N)	ONITOR WELL)
SOURCE OF SAMPLE: (Exact	Location)	
COUNTY:	VISION OF LAND/NOISE POLLUTION OF THE HEADING:	CONTROL FILE NUMBER:
Date Collected: 3-/0	SPECIAL ANALYSIS FORM Date LINOIS ENVIRONMENTAL PROTECTION	
Time Collected: 4.4	79.M. Lab	
_		

D020129 E000819

Key for Determining Type of Monitoring Point (S) Surface Water (G) Organd Water (L) Leaguage X) Special	•
	ì
	2
(1) Upetreem (1) Monitor Well (1) Flow or (1) Soil seep	3
(2) Mid-site (2) Private well (2) Pond (2) Waste	ز
(3) Commettees (3) Spring 3) Collection (3) Other (4) Run-off (4) Lysimpter System	,
(5) Impounded (5) Public V S	÷
Marien 11/611	
Name Frivate Ael., Jiram. Upring, Impounded Nater only)	,
•	
L P C C M C I C SITE INVENTORY (I) (II)	•
	6
MONITOR POINT G109 DATE 031181	6
6 6	7
ST. CLAIR SO LPC REGION S	
- CANONIA DEAD CORRE	_
CHIUNIA JEHU CKEEK	2
(Destion) . Responsible rerty)	3
Legal (1); Illerel (2); Indicate One: 80ard Order (X) (29)	3
Time Collected (29)	4
(30)	5
Stick-up 03.5ft. Depth to water 9. ft.	
(31) (13) (from f.d.c.) (34) (35)	*
Sample temp. O Background (X) (37) (39)	6
3 1	6
Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other - Specify) (41)	7
Direct - Henry love Man	
Sample Appearance: UKIT UKK JIMOVA VACOT	
	-
T. D.W 373	7.
T. D.W 373	<i>?</i> 3
Collector comments: REMAND ONE VOLUME 3-10-81.	
T. D.W 373	3.
Collector comments: REMAND ONE VOLUME 3-10-81.	3
COLLECTOR COMMENTS: REMAND ONE VOLUME 3-10-81. FILTERED SAMPLES EXCEPT ON & GREE. EN BOSIE & DOUG TOLAN DLPC Discred by David Tolan DLPC	3.
Collector comments: REMAND ONE VOLUME 3-10-81. FILTERED SAMPLES EXCEPT ON & GREE.	3 4 5
Collector comments: REMAND ONE VOLUME 3-10-81. FILTERED SAMPLES EXCEPT ON & GRS. (EN BOSIE & DOUG TOWN DLPC EN BOLLE DOUG TOWN DLPC Inharorted by Doug Town. Or Company	3.
Collector comments: REMAND OVE VOLUME 3-10-11. FILTERED SAMPLES EXCEPT ON & GRSE. EN BOSIE & DOUG TOLAN DUPC EN BOUE DOUG TOLAN DUPC Innarrorted by Div. or Company LAB USE ONLY BU43549. LAB Comments:	3 4 5
Collector comments: REMAND ONE VOLUME 3-10-81. FILTERED SAMPLES EXCEPT ON & GRSE. EN BOSIE & DOUG TOLAN DLPC EN BOSIE & DOUG TOLAN DLPC IFINSTOPTED BY LAB USE ONLY BU43549. Lab Comments:	3 4 5 5
Collector comments: REMAND OVE VOLUME 3-10-11. FILTERED SAMPLES EXCEPT ON & GRSE. EN BOSIE & DOUG TOLAN DUPC EN BOUE DOUG TOLAN DUPC Innarrorted by Div. or Company LAB USE ONLY BU43549. LAB Comments:	3 4 5 5 6 6 7
Collector comments: REMAND ONE VALUE 3-10-81. FILTERED SAMPLES EXCEPT ON & GRSE. EN BOSIE & DOUG TOWN DUPC BY BOUE & DOUG TOWN. OF COMPRISE IFTHIS POPULATION DIV. OF COMPRISE LAB USE ONLY BU43549 Lab No. Date Rec'd UR 11. 1981 Pacific Div. OF Company LPCSMO20 Lab Comments: (27) (36)	3 4 5 5 6 6
Collector comments: REMARKS ONE VALUE 3-10-81. FILTERED SAMPLES EXCEPT ON & GRSE. EN BOSIE & DOUG TOWN DUPC BY BOUE DOUG TOWN DUPC IFTHAPOPTED BY DOUG TOWN DUPC LAB USE ONLY BU43549	3 4 5 5 6 6 7
Collector comments: REMAND ONE VOLUME 3-10-81. FILTERED SAMPLES EXCEPT ON & GRSE. EN BOSIE & DOUG TOWN DLFC FINISTOPLED BY DOUG TOWN DLFC IFFINISTOPLED BY DOUG TOWN DLFC IFFINISTOPLED BY DOUG TOWN DLFC IFFINISTOPLED BY DIV. OF COMPANY LAB USE ONLY BU43549 Lab No. Date Rec'd MA 11. 1981 Sample type, acceptable TES NO Sample properly preserved YES NO (77) (75)	3 4 5 5 6 6 7
Collector comments: REMAND ONE VOLUME 3-10-81. FILTERED SAMPLES EXCEPT OIL & GRSS. EN BOSIE & DOUG TOWN DLFC INTERPOLATION DIV. OF COMPANY LAB USE ONLY BU43549 Lab No. Date Rec'd 112 11 1981 Rec'd by Time 5 1.7. Sample trip. acceptable TES NO Date completed (75)	3 3 4 5 5 6 6 7 7
Collector comments: REMAND OVE VOLUME 3-10-81. FILTERED SAMPLES EXCEPT ON & GRSE. EN BOSIE & DOUG TOWN DLFC FINISHOPTED BY TOWN DIV. or Company LAB USE ONLY BU43549 Lab No. Date Rec'd MA 11. 1981 Sample type, acceptable TES NO Sample properly preserved TES NO Date completed Date Company (37) (36)	334556677
Collector comments: REMAND ONE VALUE 3-/0-8/. FILTERED SAMPLES EXCEPT ON & GREE. EN BOSIE & DOUG TOWN DUCC EN BOSIE & DOUG TOWN DUCC INTERPORTED BY DOUG TOWN DIV. OF COMPANY LAB USE ONLY BU43549 Lab No. Date Rec'd MA 11. 1981 Sample tryp, acceptable TES NO Sample properly preserver YES NO Date completed Date forgarded MAN 5 0 1981 (37) (37)	334556677 233
Collector comments: REMAND ONE VALUE 3-10-81. FILTERED SAMPLES EXCEPT OIL & GRSE. EN BOSIE & DOUG TOWN DUPC INTERPOLATED BY DOUG TOWN DIV. OF COMPENDED INTERPOLATED BY DOUG TOWN DIV. OF COMPENDED INTERPOLATED BY DOUG TOWN DIV. OF COMPENDED INTERPOLATED BY DIV. OF COMPENDED LAB USE ONLY BU43549 Lab No. Date Rec'd MAR 11 1981 (27) (36) Sample tripp. acceptable TES NO Date completed Date forwarded MAR 30 1981 (37) (36)	3 3 4 5 5 6 6 7 7 2 3 3 4
Collector comments: REMAND ONE VALUE 3-/0-8/. FILTERED SAMPLES EXCEPT ON & GREE. EN BOSIE & DOUG TOWN DUCC EN BOSIE & DOUG TOWN DUCC INTERPORTED BY DOUG TOWN DIV. OF COMPANY LAB USE ONLY BU43549 Lab No. Date Rec'd MA 11. 1981 Sample tryp, acceptable TES NO Sample properly preserver YES NO Date completed Date forgarded MAN 5 0 1981 (37) (37)	334556677
Collector comments: REMAND ONE VOLUME 3-10-81. FILTERED SAMPLES EXCEPT OIL & GREE. EN BOSIE & DOUG TOWN DLFC INTERPORTED BY DOUG TOWN DLFC INTERPORTED BY DOUG TOWN DLFC INTERPORTED BY DOUG TOWN DLFC INTERPORTED BY DOUG TOWN DLFC INTERPORTED BY DOUG TOWN DLFC INTERPORTED BY DOUG TOWN DLFC INTERPORTED BY TOWN OF COMPANY LAB USE ONLY BU43549 Lab No. Date Rec'd 1/12 11 1981 (27) (36) Sample typ. acceptable TES NO Date completed Date Corpared MARI 3 0 1981 (37) (36) (37) (36)	3 3 4 5 5 6 6 7 7 2 3 3 4

*Analyses are to be performed on <u>unfiltered</u> samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

FARALETERS	CTM/s
Xalkalinity*	58
Amoria as 9	L5
Arcenin Au	39
X fortur in	a.1
Y 900 -4	_335
X Borns R	05
Cagrium Jun	. 0.07
Calci # In	431.
X rot	930
X Coloride []	ンイ

Chromium Cr. (to-	0.01
Chromium Crim	
Copper Cu	67.0_EE
Cyani le di	000 \$
₹ \$₹₹₩₩	ELLE
XFluoride F	1.71 数数
Hardness TaCo;	1601 1111
X Iron Fe	
Lead Ph	0.0

Chemestum to	138. INC
Standanene ith	6.22
Mercury Hr.	0 0 0 0 3.
Xilckel Ni	123. EEE
Mitmie-nitrite 3	0.3xm
X011 164 Grease	1 2 1 E X
pH (Units)	EN WILLET
Meroliza	146 5
Phonphomic 7	22 11
Potenti - I	6,41

4.7.h. (1-70g)	3880 1111
X 50,450 to 50	00031
Tii on Ag	0.00 E
s all multoc.	12.12.1
X SC (umhos/cm)	マススの 家子子書
Sulface 504	2629 - 11 11
X Ire a	6.3==
XSULFID	000

Alkalinity is to be information of operational of the carbon at pH 4.5.

ILLINOIS ENVIRONMENTAL TECTION AGENCY DIVISION OF LAND/NOISE CLUTION CONTROL CHEMICAL ANALYSIS FORM

Key for Determining Type of	Monitoring Point	
(S) Surface Water (S) Sround Water	(L) Leachate X1 Special	27
-TI Opetreem (1) Monitor Well	(1) Flow or (1) Soil	
	geep 2) Pond (2) Weste	31
(2) Mid-site (2) Private well (3) Downstream (3) Spring	(3) Sollection (3) Other	:7
(a) Ryn-off (a) Waiseter	System	-4
(5) Impounded (5) Public H S	111	
MONITOR	INELL	-0
Name Private Hell, Stream, Spring,	Impounded Mater only:	53
<u> </u>		52
SITE INT	(57 75)	
		64
HOWITOR POINT G 07 DATE	03118/	60
		73
ST. CLAIR 201	PC REGION <u>J</u>	
T		
CAHOKIA)EAD (. REEK	27
(Cocation)	(Responsible Party)	33
Legal (1); Illegal (2); Indicate One:	2 Board Order (X)	
Lagar (1); illegal (2); indicate one.	(28)	39
Time Collected 7:51	ible to collect sample (X)	45
•	100 (N)	52
	oth to water 10.7st.	
(<u>ir</u>) (<u>ir</u>)	om T.O.C.) (34) (35)	%
Sample temp. 37) 39) Bac	:kground (X)	61
127	207	65
Ground water sampled by (Indicate on		70
(2) Pumping; (3) Other (Specify)		70
(2) Pumping; (3) Other (Specify) Sample Appearance:	(at)	70
(2) Pumping; (3) Other (Specify) Sample Appearance:	(at)	70 27
(2) Pumping; (3) Other (Specify) Sample Appearance: T.D.W	- 27 ²	27
(2) Pumping; (3) Other (Specify) Sample Appearance:	- 27 ²	27 32
(2) Pumping; (3) Other (Specify) Sample Appearance: T.D.W Cullector comments: REMOVEE	- 272 ONE VOLUME	27 32 38
(2) Pumping; (3) Other (Specify) Sample Appearance: T. D. W. Collector comments: REMOVER 3-10-81: FULLERAD S.	- 272 ONE VOLUME AMPLES EXCEPT. OILY GREEN	27 32
(2) Pumping; (3) Other (Specify) Sample Appearance: T. D. W. Collector comments: REMOVER 3-10-81; MARKO S. KEN BOUR & DOUG	- 272 OUE VOLUME AMPLES EXCEPT. OILYERS TOLAN DLPC	27 32 38
(2) Pumping; (3) Other (Specify) Sample Appearance: T. D. W. Collector comments: REMOVER 3-10-81; MARKO S. KEN BOUR & DOUG	- 272 ONE VOLUME AMPLES EXCEPT. OILY GER TOLAN DLPC OUN " TILPC	27 32 38 46 51
(2) Pumping; (3) Other (Specify) Sample Appearance: T. D. W. Collector comments: REMOVER 3-10-81: FULLERAD S.	- 272 OUE VOLUME AMPLES EXCEPT. OILYERS TOLAN DLPC	77 32 38 45 51 56 56
(2) Pumping; (3) Other (Specify) Sample Appearance: T. D. W. Collector comments: REMOVER 3-10-81; MURAGO S. EN BOUR & DOUG. Can Bour & Doug. Can Bour & Doug. Can Bour & Doug. Can Bour & Doug. Can Bour & Doug.	- 272 ONE VOLUME AMPLES EXCEPT. OILY GER TOLAN DLPC OUN " TILPC	27 32 38 46 51
(2) Pumping; (3) Other (Specify) Sample Appearance: T.D.W. Collector comments: REMOVEL 3-10-81; MARKO S. EN BOUE & DOUG CAN BOUE & DOUG Cransported by LAB USE ONLY BU43547	- 272 ONE VOLUME AMPLES EXCEPT. OILY GREET TOLAN DLPC OLIN OF STEPPE DIV. OF COMPANY	77 32 38 45 51 56 56
(2) Pumping; (3) Other (Specify) Sample Appearance: T. D. W. Collector comments: REMOVER 3-10-81; MLIERRO S. KEN BOUR & DOUG CAN Bleeded by Doug Can Bleeded by Doug LAB USE ONLY Lab No. BU43547.	- 272 ONE VOLUME AMPLES EXCEPT, OILS GREET OLAN DLPC OLAN OF COMPANY DIV. OF COMPANY UPCSMO20	27 32 38 45 51 56 60
(2) Pumping; (3) Other (Specify) Sample Appearance: T.D.W. Collector comments: REMOVEL 3-10-81; MARKO S. EN BOUE & DOUG CAN BOUE & DOUG Cransported by LAB USE ONLY BU43547	- 272 ONE VOLUME AMPLES EXCEPT, OILS GREET OLAN DLPC OLAN OF COMPANY DIV. OF COMPANY UPCSMO20	27 32 38 35 55 60 A1 70
Collector comments: REMOVER 3-10-81: REMOVER EN BOUE & DOUG Finsported by LAB USE ONLY Lab No. Date Rec'd N.R 11 1981	- 27 1 ONE VOLUME AMOLES EXCROT. OILS 64.9 TOLAN DLPC OUN OF COMPANY LPCS4020 Lab Comments:	27 32 38 55 56 60 61
Sample Appearance: T.D.W. Collector comments: REMOVER 3-10-81; REPEASO S. EN BOUE & DOUG. EN BOUE & DOUG. Canaported by LAB USE ONLY Lab No. Date Rec'd NAR 11. 1981 Rec'd by Time S. a.a. p.m.	- 27 1 OME VOLUME AMPLES EXCEPT. OILY 64 9 OUNY OF COMPANY DIV. OF COMPANY LPCSH020 Lab Comments:	27 32 38 35 55 60 A1 70
Collector comments: KEMOVEL 3-10-KI: MILIERGO S. EN BOUE & DOUG Canaported by LAB USE ONLY Lab No. Date Rec'd HIR 11. 1981 Rec'd by Time S. P.B. Sample tend acceptable (TS) MO	- 27 1 OME VOLUME AMPLES EXCEPT, OILY 64 9 OLAN DLPC OLAN OF COMPANY LPCSH020 Lab Comments: (27) (75)	27 32 38 35 55 60 A1 70
Collector comments: KEMOVEL 3-10-KI: MILIERO S EN BOUE & DOUG Callector comments: KEMOVEL 3-10-KI: MILIERO S EN BOUE & DOUG CAN Blected by Doug LAB USE ONLY Lab No. Date Rec'd HIR 11, 1961 Rec'd by Time S Sample properly preserved (TES) NO Date completed	- 272 OME VOLUME AMPLES EXCEPT. OILS GLO OUN OF COMPANY LPCSH020 Lab Comments: (77) (76)	27 32 38 35 55 60 67 70 TO
Collector comments: KEMOVEL 3-10-81: MARIAGO S EN BOUE & DOUG Canaported by LAB USE ONLY Lab No. Date Rec'd NAR 11 1981 Rec'd by Time Spin. Sample temp acceptable (TES) NO Sample properly preserved (TES) NO	- 27 1 OME VOLUME AMPLES EXCEPT. OILY 64 9 OUNY OF COMPANY DIV. OF COMPANY LPCSH020 Lab Comments:	27 32 38 35 55 60 61 70 75 TO 31
Collector comments: KEMOVEL 3-10-KI: MILIERO S EN BOUE & DOUG Callector comments: KEMOVEL 3-10-KI: MILIERO S EN BOUE & DOUG CAN Blected by Doug LAB USE ONLY Lab No. Date Rec'd HIR 11, 1961 Rec'd by Time S Sample properly preserved (TES) NO Date completed	- 27 1 OME VOLUME AMPLES EXCEPT. OILS 64 9 TOLAN DLPC OLAN DLPC OLAN OF COMPANY LPCSMO20 Lab Comments: (27) (36) (27) (36)	27 32 36 52 56 66 67 70 75 TH 32 F
Collector comments: KEMOVEL 3-10-KI: MARKO S EN BOLE T DOUG Callector comments: KEMOVEL 3-10-KI: MARKO S EN BOLE T DOUG Can Bole T Doug	- 272 OME VOLUME AMPLES EXCEPT. OILS GLO OUN OF COMPANY LPCSH020 Lab Comments: (77) (76)	27 32 36 52 56 66 67 70 75 TH 32 F
Collector comments: KEMONES 3-10-81: MARAGO S EN BOUE & DOUG Cansported by LAB USE ONLY Lab No. Date Rec'd HAR 11 1981 Rec'd by Time Semple properly preserved (YES) NO Cate completed Date forwarded MAR 11 1981 Supervisor Signature	- 27 1 OME VOLUME MOLES EXCEPT. OIL 164 9 OLAN DLPC OLAN OF COMPANY LPCSMO20 Lab Comments: (27) (36) (27) (36) (37) (36)	27 32 38 45 52 56 60 61 70 75 CC 31 36 44
Collector comments: KEMOVEL 3-10-81: MARKO S EN BOUE & DOUG Callector comments: KEMOVEL 3-10-81: MARKO S EN BOUE & DOUG CAN BOUE & DOUG	- 27 1 OME VOLUME AMPLES EXCEPT. OILS 62 0 OUN OF COMPANY DIV. OF COMPANY LPCSM020 Lab Comments: (27) (36) (37) (36) (57) (56) (57) (56)	27 32 38 35 55 60 A1 70
Collector comments: KEMONES 3-10-81: MARAGO S EN BOUE & DOUG Cansported by LAB USE ONLY Lab No. Date Rec'd HAR 11 1981 Rec'd by Time Semple properly preserved (YES) NO Cate completed Date forwarded MAR 11 1981 Supervisor Signature	- 27 1 OME VOLUME MOLES EXCEPT. OIL 164 9 OLAN DLPC OLAN OF COMPANY LPCSMO20 Lab Comments: (27) (36) (27) (36) (37) (36)	27 32 38 35 55 60 61 70 75 TH H H 49

*Analyses are to be performed on <u>unfiltered</u> samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

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ARMETERS.	a point				
X singificant	_651				
Ammonia as 9	0.2				
Apromi De	0.004				
X Fartum In	QJ				
× 900 -/	39				
Xioren -	05				
Ceamáinn Cail	_O.ONI				
Calci in Call	18:68				
Con	47				
Chloride Il	235				

Chronium Cr (tot)	0.00
Chromium Cr*C	
Sopper Cu	Q.QLEE
Cyani le dil	000
FSSI Coli	ARES
Flanmide F	2・7種整整
Hardness (aCi);	1096
Lron Fe	2.4
Lead Ph	0.0

45,000					
Armesius Nr.	44.868				
Minimanese In	2.13#E				
Chroury Hr.	a a a a a 2				
X Hokel HI	O.O.				
X Nitrate-nitrite	OOIE				
XOLL and Greage	TREEF				
XpH (Units)	E 5 6 .7 1 E 1				
Phenyling	170 1				
Physphotes 7	U C 3 E				
Protessian E	2.14.15				

(Jr., ., t, X, J				
V. J.E. (LEMOL)	丁戶丁〇 寶麗寶寶			
Tourns um Co	0000			
X iller Ag	Q.QLEE			
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X SC (umbod/cm)	2250 AFF			
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X 1-0 -	Q. E = E			
XSULFIDE	000			

Alkalinity to to be intormined as som of Ching at pH 4.5.

ILLINOIS ENVIRONMENTAL STECTION AGENCY DIVISION OF LAND/HOISE FOLLUTION CONTROL CHEMICAL ANALYSIS FORM

Key for Determining Type of Monitoring Point	
(S) Surface Water (S) Sround Water (L) Leachate X1 Special	۱.,
(1) Monitor Well (1) Flow or (1) Soil	27
(2) Mid-eite (3) Private well (2) Pond (2) Waste	31
(3) Collection (3) Other	37
(4) August (5) Sublic 4 5	44
MONITOR WELL	د ،
Name (Private Well, Sifeam, Opring, impounded Sater only)	,,
	52
TLPCSM313 SITE INVESTORY (F) (T) (T6)	
·C 106 ···· 021121	64
MONITOR POINT (7) (20) COLLECTED (21) (26)	60
ST CLAIR CO TUPO REGION S	73
30 30. neoron	
CAHOKIA DEAD CREEK	27
(Location) (Responsible Party)],,
Legal (1); Illegal (2); Indicate One: 2 Board Order (X)	1
<u> </u>	<i>P</i>
Time Collected (X) Unable to collect sample (X)	45
(30)	52
Stick-up 02.2 ft. Lepth to water 17.1 ft. (from I.O.C.) (%) (%)	56
Sample temp. General Sackground (X),	61
(37) (37)	65
Ground water sampled by (Indicate one): (1) Bailing;	70
(2) Pumping; (3) Other (Specify) (41)	Ι ″
(2) Pumping; (3) Other (Specify) (41) Sample Appearance: BLACK & DIATY	~
	מ
Sample Appearance: BLACK & DIATY	27
Collector comments: REMUVED OVE VOLUME 3 -/0-8/3	27
Sample Appearance: BLACK & DIATY	27 32
Collector comments: REMOVED ONE VOLUME 3 - 10 - 81; FILTERED SAMPLES EXCEPT ON + GRIE KEN BORE & DOUL TOLAN DLPC	27 32 38 45
Collector comments: REMOVED ONE VOLUME 1 -/0 -8/3 FILTERED SAMPLE EXCEPT ON + GRIE. KEN BORE & DOUL TOLAN DLPC CORRECTED BY	27 32 38 45 51
Collector comments: REMOVED ONE VOLUME 3 - 10 - 81; FILTERED SAMPLES EXCEPT ON + GRIE KEN BORE & DOUL TOLAN DLPC	27 32 38 45 51 56
Collector comments: REMOVED ONE VOLUME 3 -10-81; FILTENED SAMPLES EXCEPT ON + GRIE KEN BORE & DOUL TOLAN DLPC CORRECTED BY TOLAN DLPC KEN BOSIS & DOWL TOLAN DLPC	27 32 38 45 51 56 60
Collector comments: REMUVED OVE VOLUME 3 -/0-8/1, FILTERED SAMPLES EXCEPT ON + GRIE. KEN BODE & DOUL TOLAN DLPC Confected by DOWN TOLAN DEPC Tensported by DIV. or Company	27 32 38 45 51 56
Collector comments: REMUVED OVE VOLUME 3 -/0 -8/1/2 FILTERED SAMPLES EXCEPT ON & GRIE. KEN BORE & DOUL TOLAN DLPC COB ecced by DOWN TOLAN DLPC Transported by DOWN OF COMPANY LAB USE ONLY Lab No. BU43546 Lab Comments:	27 32 38 45 51 56 60
Collector comments: REMOVED OVE VOLUME 1 -/0 -8/1 FILTERED SAMPLES EXCEPT ON + CRIE. KEN BODE & DOUL TOLAN DLPC Consecred by TOLAN DLPC Transported by DIV. or Company LAB USE CHLY Lab No. BU43546 Date Rec'd 142 11 1931 (27) (27)	27 32 38 45 51 56 60 61
Collector comments: REMOVED OVE VOLUME 1 -/0 -8/1/ FILTENED SAMPLE EXCEPT ON + CRIE KEN BODE + DOUL TOLAN DLPC KEN BOSIS + DOUL TOLAN DLPC TENSPORTED by DIV. OF CONDETE TENSPORTED by DIV. OF CONDETE LAB USE ONLY LAB USE	27 32 38 45 51 56 60 61 70
Collector comments: READVED ONE VOLUME 1 -/O - 1/3 FILTENED SAMPLES EXCEPT ON + CRIE KEN BOSE + DOUL TOLAN DLPC TENSPORTED by DIV. OF COMPANY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB Comments: A.B. Sample tensy acceptable (YES) NO (37) (46)	27 32 38 45 51 56 60 61 70 75
Collector comments: REMOVED OVE VOLUME 3 -/O -8/3 ENTERED SAMPLES EXCEPT ON + GRIE KEN BODE + DOUL TOLAN DLPC CONSecred by DOUL TOLAN DLPC Transported by DIV. or Company LAB USE ONLY LAB USE ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB ONLY LAB Comments: (27) (36) Sample tent acceptable (YES) MO Sample properly preserved (YES) MO Sample properly preserved (YES) MO (37)	27 32 38 45 51 56 60 61 70 73
Collector comments: READVED ONE VOLUME 1 -/O - 1/3 FILTENED SAMPLES EXCEPT ON + CRIE KEN BOSE + DOUL TOLAN DLPC TENSPORTED by DIV. OF COMPANY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB USE ONLY LAB Comments: A.B. Sample tensy acceptable (YES) NO (37) (46)	27 32 38 45 51 56 60 61 70 75 17 31
Collector comments: REMOVED OVE VOLUME 3 -/0 -8/1 FILTERED SAMPLES EXCEPT ON & CRIE KEA BODE & DOUL TOLAN DLPC Consecred by DOW, TOLAN DLPC Transported by TOLAN DLV. or Company LAB USE CHLY Lab No. BU43546 Date Rec'd 142 11 1981 Cample tend acceptable (TES) NO Sample tend acceptable (TES) NO Date completed (TES) NO Date forwarded (TAR DU 1981) Conservation (TES) NO Cample tend (TES) NO Date forwarded (TES) NO Cample tend (27 32 38 45 51 56 60 61 70 73
Collector comments: REMOVED OVE VOLUME 1 -/0 -8/1 FILTERED SAMPLES EXCEPT ON + CRIE KEN BODE & DOUL TOLAN DLPC Consected by Down Tolan DLPC Consected by Down Tolan DLPC Franchorted by Tolan DLPC Consected by Down Tolan DLPC Consected by Do	27 32 38 45 51 56 60 61 70 75 17 31
Collector comments: READVED OVE VOLUME 1 -/0 -8/1 FILTERED SAMPLEI EXCEPT ON + CRIE KEN BODE & DOUL TOLAN DLPC Confected by DOWN OF COMPANY LAB USE ONLY Lab No. BU43546 Date Rec'd HAZ 11 1901 Cample tens acceptable (725) NO Sample tens acceptable (725) NO Date completed Date forwarded NIAR 3 U 1981 Contents: (37) (36) (37) (56)	27 32 38 45 51 56 60 67 75 73
Collector comments: READVED OVE VOLUME 1 -/0 -8/1 FILTENED SAMPLE EXCEPT ON + CRIE KEA BODE & DOUL TOLAN DLPC COBSECUE! BY DOWL TOLAN DLPC Fransported by DIV. or Company LAB USE ONLY Lab No. BU43546 Date Rec'd US 11. 1901 Carrier Sample temp acceptable (TES) NO Sample temp acceptable (TES) NO Carrier Sample temp acceptable (TES) NO Date completed Date forwarded MIAR SU 1981 Address: Address: (57) (56)	27 32 38 45 51 56 60 61 70 75 17 31 34 44
Collector comments: READVED ONE VOLUME 3 -/O -F/3 FILTENCO SAMPLE EXCEPT ON & GRIP KEA BODE & DOUL TOLAN DIPC CORRECTED BY DOUL TOLAN DIPC CORRECTED BY TOLAN DIPC COR	27 32 38 45 51 56 61 70 70 27 31 34 49 53
Collector comments: REMOVED ONE VOLUME 3 -/0 -8/3 FITTERED SAMPLES EXCEPT ON & GRUE KEN BORE & DOUL TOLAN DLPC Consected by	27 32 38 45 51 56 60 61 70 75 73 44 49

Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

	_F (:2 /0)0			
ARAMETER	2016			
Marieny	_594			
X Amoria is U	3.0			
Arsenia Aş	0 085			
Parium in	03			
X gop 4/	19			
Serin -	25			
Ceans un Daige	0.00			
Calcium in	175.			
COF	146			
Coloride []	150			
LF.				
Chromium Cr (tot)	Q.00 # E			
Chromium Cr*C	事 数			
Copper Cu	Q.QL			
X Cyantile 11	0.00			

Fluoride F Hardness (nC) Iron Fe

Ammedium Hr	44.84
Marianese In	1.6乙基量
Agroupy Hr	0 .00 R L
licket NI	0.0
Mitrate-nitrite 4	001
X011 and Greace	2.2.2.2
DH (Units)	EE_6.72EE
Pherolis:	0.000
Phosphomis 2	1.5 BE
Potrispium (
Det.	*** *

		• 7						
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X Sodium Ha %					4			
	4	Ł	1	Q	Ī	I	<u>¥.</u>	<u>r</u>
Sulfate 304		L	¥	6	_	X :	<u> </u>	1
X ire .r		_	_	Q	.1	<u> 5:</u>	*	Ľ
XISULFIDE		_	_	<u>0</u>	00	2_	_	_

Alkalinity is to be determined as por of Carry at pH 4.5.

_ Key for Determining Type of	'their series Point	
	(C. Leachate X) Special	
(1) Upstresm (1) Monitor Well	(1) Flow or (1) Soil	27
		31
(2) Mid-site (2) Private well (3) Commatream (3) Opping	(2) Pond (2) Weste 3) Collection (3) Other	37
(4) Aun-off (4) waimter	System	-4
(5) Impounded (5) Public V S	1./	۲۵
/V/ONITOR	WELL	-
Name (Private Well, Stream, Spring,	impounded (after only)	53
TLP 0 S W 0 1 0 SITE INV		52
1 (2)	(T) = = = = = (IB)	64
MONITOR POINT G / O DATE COLLECTE	23/18/	60
NUMBER (17) 25) COLLECTE	(21) - (26)	71
_ST. CLAIR_30 1	PC REGION 5	,,
	 	
CAHOKIA L	DEAD_C_REEK	27
(Location)	(Responsible Party)	33
Legal (1); Illegal (2); Indicate One:	2 Board Order (X)	39
		-
Time Collected 7.23 p.m. Una		45
a	Λα ν. (π)	52
Stick-up ft. Dep	oth to water 09. (%)	56
CAMBDIE LEMB. TO DEC	KKITOUNE (A) [61
(河) (河)	4σ)	65
Ground water sampled by (Indicate one): (1) Sailing; Z	
(2) Pumping; (3) Other (Specify)	(4T)	70
Sample Appearance:		
T.DW.	- 25	77
<i>V</i>	11.10 1/20 0 3 1/4	<u>.</u> ;2
Collector comments: KEMONED	UNE VOLUME 370-8)is
FILTERED SAMPLES E	XCEOT OILS GREE	65
KEN BOSIE + DOUG	TOLAN DLPC	
Dected by		51
KEN BOSIE & DOUG	TOLAN COMPANY DIV. OF COMPANY	56
		ഩ
LAB USE ONLY BU43541	LPCGMO20 Lab Comments:	43
Lab No.		70
Date Rec'd 1112 11 1981	(27)(36)	-
Rec'd by OO Time 5	(20)	75
	(77)(76)	
Sample temp()acceptable (725) NO Sample properly preserved (725) NO	(31)	27
Date completed	(27)(元)	31
Date forwarded MAR 30 1981.		:ہز
	(57)(底)	
Supervisor Signature	(36)	44
	- 1	
W 1	(87)	49
Address	(67)————————————————————————————————————	
	Private Lab (X)	49 53 58
Address		

^{*}Analyses are to be performed on unfiltered samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

	3:0:0
PARAMETERS	97914
Altalining	703
Ammonia as V	0 2_
APTATL AL	2 001
Rant La Gr	0.0
Xect =4	/ 6
X Boron -	一一一万一万家庭园。
Cedmi um Gu	0:00
Calcium Ca	_154.
X cor	
Chloride 31	16
. 3	77.40
Chromium Cr (tot)	0.0044
Chromium Or **	, p
Copper Co	0.04
Cymnide (N	0.00 #
F\$5tho Call	
XFluoride F	05
Hardness CaCh;	542 1 1 1
X lron Fe	Q.382E
Lesa Ph	Q.0 BE
11.	777 110
X:hmestus H:	34.2至重整
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XpH (Units)	6.9x x x
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i.r	**************************************
4.7.E. (1807)	676 EEE
Telebiam Co	0 0 001
Tilline Ag	0.01
Codium Hn (
SC (ushos/cm)	1050111
Sulface 304	118. 22.

Alkalinity is to be intermined as one of CarO; at pH 4.5.

E000823

0-1255

ILLINOIS ENVIRONMENTAL TECTION AGENCY DIVISION OF LAND/HOLSE VULLUTION CONTROL

. Key for Determining Type of		1 1		
	Monitoring Point	71	FARMETERS	270
(5) Surface Water (5) Sround Water (1) Monitor Well	(1) Leachate X) Special (1) Soil	27	Alkalletty	7 64 11
T Joe of earth	seep	[] n	Amonia 15 %	0.0
(2) Mid-site (2) Private well (3) Communication (3) Spring	(2) Pond (2) Weste (3) Collection (3) Other	37	Arse-1: A.	2000
(4) Run-off (4) Lysineter (5) Impounded (5) Public N S	System	44	K fertur in	0.2
MONIT	e MEII	40	X 900 -4	
Name (Private Well, Stream, Opring,	impounded Water only)	57	X Burrn F	2 - 4 - 4 8 8
TEPCSMOLO SITE IN			Cad-sum Cayer	O.O:L 18
(I)	(57 (16)	64	Calaian c	33.3.
MENITOR POINT (20) DATE COLLECTI	DILOXI	مه ا	Cor -A.	24
ST. CLAIR CO		73	Chloride 71	124
31. Junia	Section (S)	11 .		SE Corpus
CAHOKIA /	EAD CREEK	27	Chromium Cr ((101) 0.00
(Location)	(Responsible Party)	33	Chromium Cr**	
Legel (1); Illegel (2); Indicate One	: 2 Board Order (X) (29	r 17	Copper Cu	0.06
Time Collected 3:50	able to collect sample (X)	4,9	Cyanide (3)	000
	179 (30)	52	F\$58 mcell	2 2 2 1
Stick-up $Q = Q $ ft. Ueg	oth to water (2.2) ft. on T.O.C.) (3.2) (3.6)	16	Flunride F	0.7 = 1
Sample temp. ° Bac	ekground (X). ب (A)	61	Hardness CaCu	1002種種類
(3/)		65	X Iron Fe	0.34 21
Ground water sampled by (Indicate one (2) Pumping; (3) Other (Specify)	e): (1) Bailing;	70	Load Ph	0.0
	-			
Samble appearance:				1,100,20,90
Sample Appearance:	- 300	77	X-Immedium H:	77.9
T.D.W.	- 30°		Anneatus Hr	
Collector comments: REMOVED	DNE VOLUME;	32		77.9
T.D.W. Collector comments: REMOVED FILTERED SAMPLES EX	ONE VOLUME:	32 38	Mancanese in	77.9
T.D.W. Collector comments: REMOVED FILTERED SAMPLES EX KEN ROSE & DOVG	ONE VOLUME: CEPT OIL & GRE. TOLAN DLPC	32 38	Mancanese in	
T.D.W. Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG KEN BOSIE & DOVG	DNE VOLUME; CEPT OIL & GRE. TOLAN DLPC TOLAN "DEPC	32 38 45	Annuanese in Aeroury but Milchel NI	
T.D.W. Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG KEN BOSIE & DOVG Transported by	ONE VOLUME; CEPT OIL & GRE. TOLAN DLPC TOLAN DLPC TOLAN OF DLPC	32 38 45 51	Manganese in Vercury hm Viickei NI Mitrate-nitri	
T.D.W. Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG KEN BOSIE & DOVG Transported by	DNE VOLUME; CEPT OIL & GRE. TOLAN DLPC TOLAN "DEPC	32 38 45 51 56 60 63	Manganese Ph Vercury Nr Vickel NI Mitrate-nitri Oil and Greag pH (Units) Merroling	77.9 E
Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG Transported by LAB USE ONLY LAB NO. BU43542	ONE VOLUME: CEPT OIL & GRIE. TOLAN DLPC OLAN OF COMPANY LPCSM20 Lab Comments:	32 38 45 51 56 60 43 70	Americanese Ph Agreety Vir Clickel NI Mitrate-nitri Oil and Grean pH (Units) Phosphomic 7	77.9 1 1 2 2 9 8 1 1 2 2 9 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Collector comments: REMOVED FILTERED SAMPLES EX KEN ROSSE & DOVG KEN BOSSE & DOVG Transported by LAB USE ONLY Lab No. Date Rec'd 112 11 1981	ONE VOLUME; CEPT OIL & GRE. TOLAN DLPC OLAN DLY, OF DLYPC DIV. OF COMPANY LPCSMO20	32 38 45 51 56 60 43 70	Manganese Ph Vercury Nr Vickel NI Mitrate-nitri Oil and Greag pH (Units) Merroling	77.9 1 2 2 9 8 1 1 2 2 9 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG (FIN BOSIE & DOVG Transported by LAB USE ONLY LAB US	ONE VOLUME: CEPT OIL & GESE. TOLAN DLPC OLAN DLPC DIV. OF COMPANY LPCSMO20 Lab Comments: (27) (36)	32 38 45 51 56 60 61 70 75	Americanese Ph Agreety Vir Clickel NI Mitrate-nitri Oil and Grean pH (Units) Phosphomic 7	77.9 1 1 2 2 9 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG (FIN BOSIE & DOVG Transported by LAB USE ONLY LAB US	ONE VOLUME: CEPT OIL & GRIE. TOLAN DLPC OLAN OF COMPANY LPCSM20 Lab Comments:	32 38 45 51 56 60 61 70 75	Americanese Ph Agreety Vir Clickel NI Mitrate-nitri Oil and Grean pH (Units) Phosphomic 7	77.9 1 2 2 9 8 1 2 2 9 8 1 2 2 9 8 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOUG Transported by LAB USE ONLY Lab No. Date Rec'd MIR 11 1981 Rec'd by Time Sim. Sample properly preserved (YES) NO. Sample properly preserved (YES) NO.	ONE VOLUME: CEPT OIL & GESE. TOLAN DLPC OLAN DLPC DIV. OF COMPANY LPCSMO20 Lab Comments: (27) (36)	32 38 45 51 56 60 63 70 73	Mannamese In Mercury Mr Clickel NI Mitrate-nitri Oil and Gread pH (Units) Phosphomus 7 Potassium (77.9 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG Transported by LAB USE ONLY Lab No. Date Rec'd 112 11 1981 Rec'd by Time TES NO Sample topo, acceptable TES NO Sample properly preserved TES NO	ONE VOLUME: CEPT OIL & GRIB. TOLAN DLPC TOLAN DLPC DLV. or Company LPCSM020 Lab Comments: (27)	32 38 45 51 56 60 63 70 75	Hancanese Ph Vercury Nr Vickel NI Mitrate-nitri Oil and Greac pH (Units) Phornhamic 7 Potassium I'	- 77.9
Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOUG Transported by LAB USE ONLY Lab No. Date Rec'd MIR 11 1981 Rec'd by Time Sim. Sample properly preserved (YES) NO. Sample properly preserved (YES) NO.	ONE VOLUME: CEPT OIL & GRE. TOLAN DLPC OLAN OF COMPANY LPCSM20 Lab Comments: (27) (36)	32 38 45 51 56 60 63 70 75	Januariese Ph Jercury Nr Jickel NI Mitrate-nitri Oil and Grear pH (Units) Phosphomic 7 Potassium N Journal Co. Jou	77.9 1 1 2 2 2 9 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG Transported by LAB USE ONLY Lab No. Date Rec'd MAR 30 1981 Supervisor, Signature	ONE VOLUME: CEPT OIL & GRE. OLAN DLPC OLAN DLPC DIV. or Company LPCSM020 Lab Commente: (27)(36) (37)	32 38 45 51 56 60 63 70 75	Mancanese Ph Mercury Nr Mitchel NI Mitc	- 77.9
Collector comments: REMOVED FILTERED SAMPLES EX KEN ROSE to DOVG Fransported by LAB USE ONLY Lab No. Date Rec'd 112 11 1581 Rec'd by Time Sample topo. acceptable Sample topo. acceptable (TS) NO Date completed Date completed Date completed Date completed Sample topo. Sample topology preserved (TS) NO Date completed Date completed Date completed Date completed Supervisor, Signature Name Address	ONE VOLUME: CEPT OIL & GRE. OLAN DLPC DIV. OF TOPPC DIV. OF COMPANY LAB COMMENTA: (27) (36) (37) (37) (36) (57) (56) Private Lab (X)	32 38 45 51 56 60 61 70 73 11 36 44 49	Januariese Ph Jercury Nr Jickel NI Mitrate-nitri Oil and Grear pH (Units) Phosphomic 7 Potassium N Journal Co. Jou	- 77.9
Collector comments: Removed FILTERED SAMPUS EX KEN BOSIE to DOVE Transported by LAB USE ONLY Lab No. Date Rec'd 112 11 1981 Rec'd by Time Time Sample topp, acceptable TES NO Date completed Date completed Discorphisher Signature Name	ONE VOLUME	32 38 45 51 56 60 63 70 75	Januariese Ph Jercury Nr Jickel NI Mitrate-nitri Oil and Great pH (Units) Phosphomic 7 Potassium N Journal Co Jilver Ac Godium Na SC (unhos/cm Sulfate SO ₂ Tire in	77.9 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Collector comments: REMOVED FILTERED SAMPLES EX KEN BOSIE & DOVG Transported by LAB USE ONLY Lab No. Date Rec'd MAR 30 1981 Supervisor Signature Name Address of Lab	ONE VOLUME	32 38 45 51 56 60 63 70 73 27 31 34 44 49 53	Januariese Ph Jercury Nr Jickel NI Mitrate-nitri Oil and Great pH (Units) Phosphomic 7 Potassium N Journal Co Jilver Ac Godium Na SC (unhos/cm Sulfate SO ₂ Tire in	- 77.9
Collector comments: REMOVED FILTERED SAMPLES EX KEN ROSE to DOVG Fransported by LAB USE ONLY Lab No. Date Rec'd 112 11 1581 Rec'd by Time Sample topo. acceptable Sample topo. acceptable (TS) NO Date completed Date completed Date completed Date completed Sample topo. Sample topology preserved (TS) NO Date completed Date completed Date completed Date completed Supervisor, Signature Name Address	ONE VOLUME: CEPT OIL & GRSE. OLAN DLPC DIV. or COMPANY LPCSN20 Lab Comments: (27) (36) (37) (37) (36) (57) (56) Private Lab (X) ITPA Lab (X) OTA OTA Iltered samples. *Velues ported in the lab comments section	32 38 45 51 56 60 61 70 75 27 11 31 44 49 53 58 63	Mannamese Ph Mercury Nr Mitchel NI Mitrate-nitri Oil and Greas pH (Units) Phorphomic 7 Potassium I' Xilier Ac Codium Na SC (unbos/cm Sulfate SO ₄ 'inc.ir	- 77.9

LILLINGIS ENVIRONMENTAL JECTION AGENCY DIVISION OF LAND/HOLSE POLLUTION CONTROL CHEMICAL ANALYSIS FORM

CHERICAL ARALYSIS FORM	}
- Key for Determining Type of Monitoring Point	
(S) Surface Water (G) Ground Water (L) Leachate X: Special T) Westream (1) Monitor Well (1) Flow or (1) Soil	2
seep	3:
(2) Mid-site (2) Private well (2) Pond (2) Waste (3) Copynatream (3) Spring (3) Collection (3) Other	3
(3) Constream (3) Spring (3) Collection (3) Other (4) Runoff (4) Lysimeter System	•
(5) Impounded (5) Public W S	4
MONTOR WELL	•
Name Private Well, Stream, Spring, impounded dater only	5
	5
TIPE SM 3 1 3 SITE INVENTORY (3) (26)	
1 - '	64
MONITOR POINT G-103 DATE 0310K1	64
1	7
ST CLAIR SO LPC REGION ST	
Drag Corne	!
CAHOKIA DEAD CREEK	2'
	3
tegal (1); Illegal (2); Indicate One: Board Order (X)	3.
(3)	4
Time Collected 3:31 (30)	
	5.
Stick-up 00.2 ft. Depth to water 27.0 ft. (from T.O.C.) (31) (35)	54
Cample temp. O Background (X)	6
() ()) () ())	6
Ground water sampled by (Indicate one): (1) Sailing;	
(2) Pumping; (3) Other (Specify)	71
Sample Appearance:	١.
T.D.W 3/2	2
	3.
Collector comments: KEMOVED ONE VOLVME:	١,
FILTERED SAMPLES EXCEPT OIL+ GRIE.	1
KEN BOYE + DONG TOLAN DLPC	4
Cliested by Communication of Communication	5
KEN BOSIS TO DOWN TO SIV. or Company	١,
Transported by Div. or Company	
LAB USE ONLY DUADE ACT LPCSIO20	۱
Lab No. BU43543 Lab Commenta:	٩
11 1581	7
Date Rec'd (27) (27)	,
Rec'd by Time 5 p.m.	l
Sample test, acceptable (73) NO (77)	۔ ا
Sample property preserved (YES) NO	٦
Cate Constituted (37)	•
Communication WHIT TO THE DI	1
Supervisor Signature (57) (66)	,
Supervisor Signature]
Name (67)(76)	ľ

*Analyses are to be performed on <u>unfiltered</u> samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

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<u>,</u>	X Coarium Ci	
	Calai = 31	O.O.s.
٠		47
	con	
3	Chloride II	
. 1	M	
7	Chromium Cr (tot)	0.00
"	Chromium fr ^{ee}	0.00
9	Copper Cu	0.08
٠	Cyant le di	0.00
2	F55120551	
6	Fluoride F	0.8
1	Hardness Calle:	620 E E E
5	X Iron Fe	1.6
o	Lead Ph	Q.Q_
٠,	'!'	. *
7	X homesium No	41.9
2	Mancanese In	3.51# <u>#</u>
8	Sercury Hr.	o o o o l
5	Xitckel Ni	1.12 55
:	Mitrate-nitrite 4	0 () x # #
6	X011 and Grease	OILEL
ດ	XpH (Units)	E E U.PXEX
1	Phenolina	0.0051
יו מי	Phosphorus 7	0032
's	Pothydium (
		··a -
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Ή,	Zilier Ag	0.001
44	rd mulbol	45 LIEI
49	SC (unhos/cm)	1470 111
		E E 1
5.H	X 150 F	2.8 = ==

Alkalinity is to be intermined as ppm of CaCCs at pH 4.5.

ILLINOIS ENVIRONMENTAL TECTION AGENCY DIVISION OF LAND/HOISE CILLUTION CONTROL CHEMICAL ANALYSIS FORM

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		ARMITTERS
	, X	Alkalieity*
11, 5011		Ammonia is V
	∇	Arsenia Az
(3) Juner		Pari ar En
		300 -
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		Caamium (i
		Calcium Ca
_ `**'	- 11-3	Chloride II
,) AZI	
CEV ,		Chromium Cr (to:
		Chromium Cr ^{ee}
oerd Order (X) 7		Copper Cu
(29)		Cyanide di
/ 377 \		FSSI Coli
7.7. rt.	, X	Fluoride F
· ()	∇	Hardness (a(0);
	X	lron fe
(I) 7		Lend Ph
1		,
7	, K	Fresium Mr
OLUME: 3		Micranese In
	117	Mercury Hr.
DI OF		iickel Ni
PTS DE 1	X	Nitrate-nitrite
plity ,	X	011 and Greace
020	、 IV	hatt (11ml n n)
	' P	pH (Units)
ents:	, X	Chercita:
ents:	XX	Chenolia: Phosphodus 2
ents:	XX	Chercita:
ents:	XX	Phonolis: Phonphonic 7 Polacii, c (
ents:(35)(75)		Chenolia: Phosphodus 2
ents: (7) (76) (76) (76) (76)		Phoneline Phoneholic Polaceline H.O.B. (14000) Polaceline
enta: (36) (36) (36) (36)		Phonolist Phonophorus 2 Potablist 1 1 1 1 N.O.B. (14000) Potablist 00 Tilmor Ag
ents:(35)(35)(35)(35)(35)(35)(35)		Phonolist Phonophodus 2 Pritate (1,000 N.O.E. (1,000 Colemans Colombia Codium Na ()
ents:(死)(死)(死)(死)(死)(死)(死)		Phonolina 2 Phonophoria 2 Phonophoria 2 Phonolina 3 R.D.E. (1900a) Polembur Co Tilmon Ag Sodium Na (4 SC (umbos/cm)
enta: (36) (36) (36) (36) (36) (36)		Phonolina Phonophorus 2 Potatis in the H.D.S. (1900s) Potatis in the H.D.S. (1900s) Potatis in the Tilling Ag Sodium Ma (2) Sc (umbos/cm) Sulfate SO ₄
ents:(死)(死)(死)(死)(死)(死)(死)(死)(死)(死)		Phonolina Phonophoduc 2 Pedaddium (H.D.E. (1990) Polensum (Tilmon Ag Sodium Na (SC (umhos/cm)
ents:(死)(死)(死)(死)(死)(死)(死)(死)(死)(死)		Phonolina Phonophorus 2 Potausius 1 H.D.E. (1900s) Southur On Cilmon Ag Sodium Na (2 CC (umhos/cm) Sulfate SO ₄
	(2) Naste (3) Other (3) Other (3) Other (4) OF (1) (5) OF (1) (7) OF (1)	X Special 27 X X X X X X X X X

1 Alkalinity is to be determined as one of CacO₃ at pH 4.5.

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comments section.

Detainment aims

Semple properly preserve

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Address

ON QUT

TYB RZE ONTL

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Castrango (()

mestrage (4

DIAISION OF LAMB/NOISE FOLLUTION CONTROL LLLIHOLS ENVIRONMENTAL OTECTION ACENCY 15 MTQ-0176

tests requested but not run should also be explained in the lab

Analyses are to be performed on unifflined anaples. "Walues

exceeding no. of piaces shown are reported in the inb comments section;

INPA LAB (X)

(X) dal staviti

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CHEMICAL WATERS FORM COMENCY OF LYND/MOTES POLITION CONTROL LITTING CONTROL LITTING CONTROL CHEMICAL WATERS FORM

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Responsible Party	AD CREEK	recton 5	730750	(3) (36)

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Time Collected 12:51 6 Legal (1); [llegal (2); Indicate One: Chable

Stick-up (31)-/33) ft.

Sample temp. (37) - 0 Uppih to water (Syrt. (from f.O.C.) (X) (X)

Ground water sampled by (Indicate one): (1) Bailing; (2) Pumping; (3) Other (Specify)

Sample Appearance:

10W- 342

Collector comments: REMOVED DUE TISSED SAMPLES EXCEPT Dove Tour On teru Voume

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Address of Lab	Supervisor Signature	TIAR S.U. 198	Sample comp. acceptable /123 NO	Date Rec'd 12.2 11.1581	LAB USE OMEY BU43548
(67) — — — — — — — (76) Private Lab (X) 177A Lab (X) (77)	(38)(88)	(27)(18)	(37)(28)	(37)(75)	LPCSID20

*Analyses are to be perform exceeding no. of places sho tests requested but not ru-comments section. rformed on unfiltered samples. Values s shown are reported in the lab comments section; or run should also be explained in the lab

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case requested but not run should also be explained in the lab exceeding no. of pieces shown are reported in the lab comments section; Analyses are to be performed on wifiltered samples. SOULAN. (X) QVI VELI SEL TO Private Lab (X) Address Supervisor Signature plastded MAR 3 0 1981 Semple tomb. acceptable ON (SZI) 1941 11 . OF GEL 1925408 :E3Ummou qu'i ATMO EST EYT ThC 2MDSO DIA: OF COMPANY ZONWY BN BOSIE pendire vbbesteuce: (S) EmmbruE: (3) Ospet (SbectLA) Crownd water sampled by (Indicate one): (1) Bailing; Sackground (X). . . Time Collected 1:34 (X) elemas reellos es eldral (X) tend attribut (5) isgail (1); inditate One: DOREG Order (X) 14 #36.Ui' Trivers well, diream, taning, impounded massr units? popumodwy (4) JJ0=UN# (*) 278 tem 3-14dg (' 3) Coffestion (3) Other asertamed ((, **0100**% (2) FUSA (2) 41 18-PTH (2) (5) befasie weff deep Tios (1) To word (1) Itam Touthow (1) Sold Touch abands (2) weedsedr 🚬

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CHEMICAL ANALYSIS FORM DIVISION OF LAND/HOISE POLLUTION CONTROL LONZON MOITOSTON. TELINOIS ENVIRONMENTAL

Key for Determine Type of Monttoring Point

Key for Determining Type of	Monitoring Point	ł
		١.
(S) Surface Water (S) Smound Water (1) Monitor Well		2
(2) Midwelle (2) Private well	Seep S) Fond (2) Waste	,
(1) Coemstream (3 Spring	3) Callection (3) Other	;
(4) Run-off - Simeter	System	÷
(5) Impounded (5) Public W S	11/1/	_
//loniler	- Well	,
Name Private Well, Stream, Spring,		
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	147)	
CAHOKIA L	LEAD ('REEK	2
(Location)	Responsible Party)	3
Legal (1); Illegal (2); Indicate One:	2 Board Order (X) (29)	3
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<u></u> y	(河)	9.
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(77) (79)	<u>(σ)</u>	6
Ground water sampled by (Indicate one	r): (1) Beiling; 2	ŀ
(2) Pumping; (3) Other (Specify)		7
Sample Appearance: SILTY &	DIRTY	
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		3
Collector comments: No Open		3
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LAB USE ONLY BU43552	LPCGM020	6
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*Analyses are to be performed on <u>unfiltered</u> samples. *Values exceeding no. of places shown are reported in the lab comments section; tests requested but not run should also be explained in the lab comments section.

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Alkalinity is to be determined as one of CaCO₁ at pH 4.5.

DATE.

February 22, 1983

TO:

Division File .

FROM:

Tom Powell - Southern Region

SUBJECT: LPC - General - St. Clair County - Cahokia/Dead Creek

On February 14, 1983, William DeLisle, 130 Edwards Place, Cahokia, Illinois (618)337-2171 phoned the Division of Water Pollution Control, Region 6, to report that substantial quantities of water are seeping into his basement. Mr. DeLisle reported that the water has an orange chemical looking substance in it, as well as a black tar-looking material upon the surface. Mr. DeLisle, worried about the recent reports of dioxin in the Dead Creek area and with the water seeping into his basement, wanted IEPA to sample to determine if any contaminants from Dead Creek are entering his basement. Since the Division of Land Pollution Control has been involved in the Dead Creek investigation, this information was forwarded to DLPC for consideration.

Attempts to contact Mr. DeLisle were not successful until he contacted this office on February 16, 1983. In speaking to Mr. DeLisle, this writer told him that a representative of the DLPC would be out to his residence the following morning to obtain water samples from his basement.

This writer arrived at Mr. DeLisle's residence at 10:00 a.m. on February 17, 1983 and as stated previously, Mr. DeLisle was concerned with the recent press reports that dioxin has been found in Dead Creek. Since his residence is approximately 200 yards east of the creek, he wanted samples taken from within his basement. The basement, constructed. of concrete block walls with a poured concrete floor had approximately 3-4 inches of very fine grained grey sand over most of the floor. The water sample point for the organics, inorganics and volitiles were taken from the foot of the basement stairs, while the sediment sample for organics was taken from the southwest corner of the basement. The southwest corner was where the orange and black tar-looking stains were observed upon the sand. It is felt, by this writer, that these stains are from the leaching of the black tar material used to seal basements against water leakage. The orange material appears to be rust, however it is not known where this material could be coming from, although metal sheets used possibly as forms in the construction of the house were noted outside of the house's foundation.

Mr. DeLisle was told that it would be several weeks before test results were finished, and at that time he would be notified of the results. After obtaining the samples, this writer departed from the site.

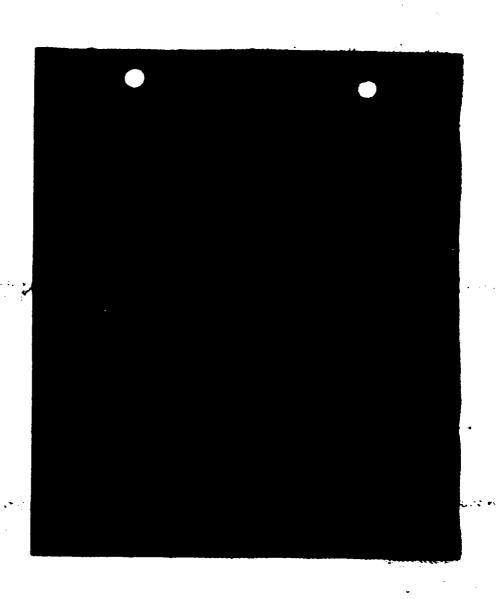
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cc: Southern Region

CER 051874

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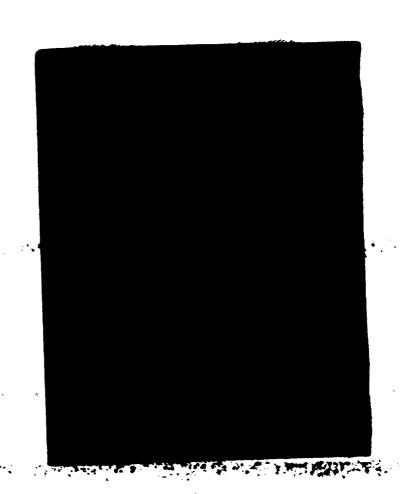
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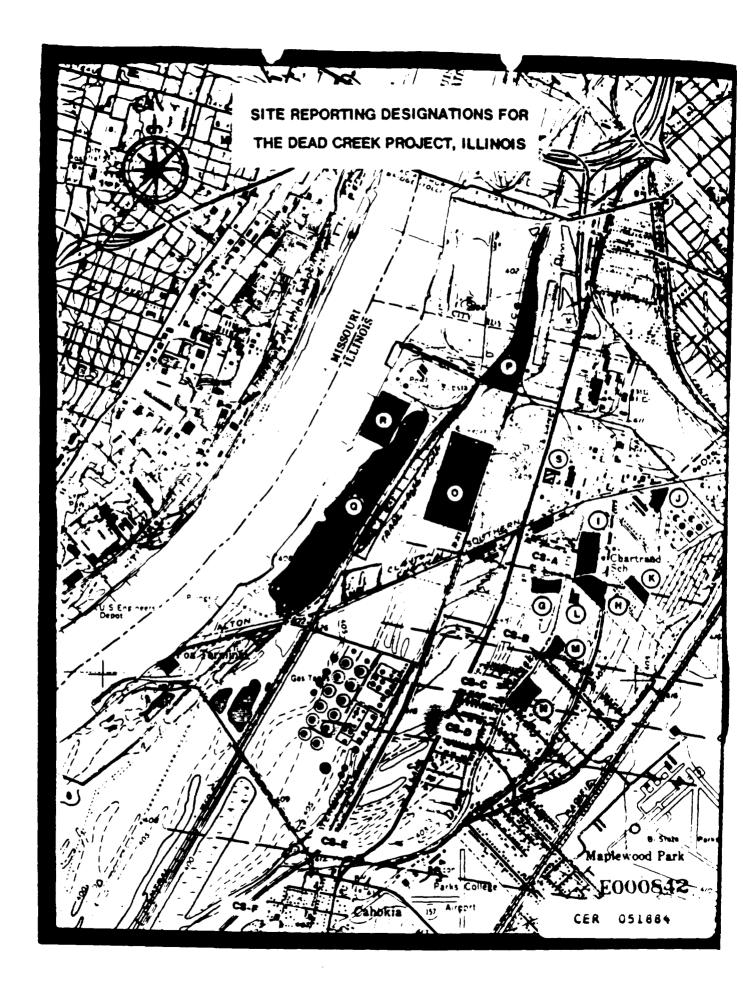
FO FO T TOOOS37 6 days of 6 X STANTO CONTRACTOR OF CONTRACTOR STANTON OF CONTRACTOR OF 17.7.7

Time Collected:	Series Oscillation		10 1583
· · · · · · · · · · · · · · · · · · ·	SPECTAL ANA	LYSIS FORM	
Date Collected:	/83	Date Recei	ved
	ILLINOIS ENVIRONMENTA		
COUNTY:	DIVISION OF LAND/NOIS FILE HEADING:		FILE NUMBER:
St. Clair	Calobia	Sead Cuch	Cenual
SOURCE OF SAMPLE: (Exact	Location)		
Sin ismale	fra under	with Judite	St. where
Culiant disco	haver - on	the south	Side of small
			C)
PHYSICAL OBSERVATIONS, RE	1		
oclose	ess · Slighty 1	menty	
			4
			a's // /
TESTS REQUESTED: Ong	race Stan - C	specially, PC	B. Cklorophenol
chelorolung in	, dichlorol	enjene, de	B's chlorophend chlorophend
Cucloherma	no ckloro	aneline -	44.0
COLLEGIED BY:		TORY 11.2730A	to magaze
	DATE	Tutt N. A. P. Style	DATE
RECEIVED BY: C.C.	COMPLETED:	A/a/83	FORWARDED: 2/9/83
<u> </u>			Atturen
PCBs < 0.12mg	-//	•	
		1 1 1 1 1 1 1	
		Not derect	ed in the extrect
of this sample	·	<u>, </u>	
		্ব	
		E	RECEIVED
		<u> </u>	(ECEIVED
			FEB 1 () 1993
		E.	P.A DIL P.C.
			CER 051880
	/	200000000000	
LPC-8A 4/77	(NOT FOR DATA	PROCESSING)	70,57730 *

	J. ~ /	U 12	27305
Time Collected: 4,00	SPECIAL ANAL	Lab #	
Date Collected:	3	Date Rece:	ived[4 10 1530 .
	OIS ENVIRONMENTAL ION OF LAND/NOISE		
St. Clair	FILE HEADING:	Sead Cuch	FILE NUMBER:
		Glad Cuch	Crouse
SOURCE OF SAMPLE: (Exact Loc			
	- Losson	1 of Bat	tu supage
102 Walnut St.	Carolin -	Sample of w	etu supaye
PHYSICAL OBSERVATIONS, REMARK	s:		
-tu-b.	d odon	hu	ž.
		• • • • • • • • • • • • • • • • • • • •	
TESTS REQUESTED: Organic	scon- ly	secully, F	CB's Colongelu
	1 // /		
Chloroloughe	Sichlorole	usene, de	cklosophund
Chlorolougene,	Cheloron	incluse.	chlosophine
Chlarologice, Cyclohylpagae, COLLEGIED BY: Survey	Cheloron	ANSFORTED BY:	Bob Hagela
	Cheloron LABORAT	ANSPORTED BY:	Bob Hagola
Chlarolougue, Cyclohyman, COLLEGIED BY: 4. C. RECEIVED BY: 4. C.	Cheloron	ANSFORTED BY:	DATE FORWARDED: -2/9/
	Cheloron LABORAT DATE	ANSPORTED BY:	Bob Hagola
200	Cheloron LABORAT DATE	ANSPORTED BY:	Bob Hagola
PCBs < 0.1 mg/	CALORO TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY	Bob Hagola
PCBs < 0.1 mg/	CALORO TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY	DATE FORWARDED: -2/9/
PCBs < 0.1 mg/s	CALORO TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY	DATE FORWARDED: -2/9/
PCBs < 0.1 mg/s Chlordone (elphonge === U+hen organice no Sample	CLESTON TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY 11/1/1/53 11/1/1/1/53 11/1/1/1/53 11/1/1/1/1/53 11/1/1/1/1/1/53 11/1/1/1/1/1/1/53 11/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	DATE FORWARDED: 2/9/ Schune
PCBS < 0.1 mg/s Chlordone (siphessen) U+4en organics no Sample	CLESTON TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY 11/1/1/53 11/1/1/1/53 11/1/1/1/53 11/1/1/1/1/53 11/1/1/1/1/1/53 11/1/1/1/1/1/1/53 11/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	DATE FORWARDED: -2/9/
PCBS < 0.1 mg/s Chlordone (siphessen) Uther organics no Sample	CLESTON TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY 11/1/1/53 11/1/1/1/53 11/1/1/1/53 11/1/1/1/1/53 11/1/1/1/1/1/53 11/1/1/1/1/1/1/53 11/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	DATE FORWARDED: 2/9/ Schune
PCBs < 0.1 mg/s Chlordone (elphonge === U+hen organice no Sample	CLESTON TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY 11/1/1/53 11/1/1/1/53 11/1/1/1/53 11/1/1/1/1/53 11/1/1/1/1/1/53 11/1/1/1/1/1/1/53 11/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	DATE FORWARDED: 2/9/ Shune
PCBs < 0.1 mg/s Chlordone (elphongen) U+hen organice no Sample	CLESTON TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY 11/1/1/53 11/1/1/1/53 11/1/1/1/53 11/1/1/1/1/53 11/1/1/1/1/1/53 11/1/1/1/1/1/1/53 11/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	DATE FORWARDED: 2/9/ Shune
PCBS < 0.1 mg/s Chlordone (siphessen) Uther organics no Sample	CALORO TR LABORAT DATE COMPLETED:	ANSPORTED BY: ORY 11/1/1/53 11/1/1/1/53 11/1/1/1/53 11/1/1/1/1/53 11/1/1/1/1/1/53 11/1/1/1/1/1/1/53 11/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	DATE FORWARDED: 2/9/ Shune

_	=	John .		111111111111111111111111111111111111111	
	3.10	CDECTAL ANALYSTS	Lab,	J.34 10 F533	
Date Collected:	15/83	SPECIAL ANALYSIS		ived A	
		ENVIRONMENTAL PRO OF LAND/NOISE POI			_
COUNTY:		and an expension		FILE NUMBER:	
St. Clair		Cakohia/ D	ead Cuch	General	1
SOURCE OF SAMPLE: (E	xact Location	on)			
Sin som	de lear	undunest	L Judit	& St who	~~
Culvet du	icha ne	- mit	Le son Th	Side of an	0
	arange.		THE REAL PROPERTY.	of non	
PHYSICAL OBSERVATIONS	, REMARKS:				
odle	aless.	slighty mu	ida		
		10	0		
					
				-	·
TECTS DEGLESTED.			· // a	20'3 -11	1 1
TESTS REQUESTED: O	your s	er - con	cally , PC	B's cklory	minol.
chlordens	e, de	chlowleng	ene, de	chlorops	mel
	none	chlowan			
COLLEGIED BY:	Predl	DLAC TRANS	PORTED BY:	no head	2
		LABORATORY	002730	<u>1</u>	
DECETIED DY. C.C.		DATE COMPLETED:	-/ /-	DATE FORWARDED: 2	14/5
RECEIVED BY: C.		CONTESTED:	2/4/53	0 //	-
				Afin	ay
PCBs < 0.1.	mg/2				
organic compos		a d a h a) da	L deles	ted in the	ashart
-		C 4 4 6 6 6 7 7 7 7 6	i de rec	7	27/- (2)
of this sampl		•			
	· ·	<i>*</i>			
			R	50.	
				ELVE	
			F	E01410-ED	
			STAE	P. 4 1983	
	·		7/5	OF ILLE	
				EST 4 1983 PA OF ILLINOIS	
100-04 //77	,	NOT FOR DATA PROC	essing)		\$
LPC-8A 4/77	•	MOT FOR DRIV SKOC	,,,,,	为2730人	

	/	Joseph .	_	5,227.30	-
Time Collected: 4	de p		Lab		·)
Date Collected: _/-	SPECIA	L ANALYSIS	FORM Date Recei	ved/14 10 1538.	
	ILLINOIS ENVIRON	n de la constant			
	DIVISION OF LAND	/NOISE POLL			
St. Clair	FILE HEA		00/	FILE NUMBER:	
M. Clan	Cake	suaf fla	I Cuch	Ceneral	
SOURCE OF SAMPLE: (Exa-	t Location)				
Din Samuel	from las	usunt	of Bats	or mide	بب
Sip Sample	St Celde	i - S.	mel of les	tu sussa	
·			, ,	7 7	``
PHYSICAL OBSERVATIONS,					
	orb, d c	Lorless	<u> </u>		
					
					 ,
TESTS REQUESTED: Organ	mic 3can-	lypur	la, Po	B's Chlore	<u>jeden</u>
Chlorobensens	Sichlo	deur	ene de	Morosphu	al
cue loheren	ac. che	mani	line -		
COLLEGIED BY:	fruit OLK		RIED BY:	ed Hagel	2_
		ABORATORY		<i>u</i>	<u> </u>
RECEIVED BY: Q.C.	DATE COMPLE	TED: 5	167305	DATE FORWARDED:	19/8
		,		84	mei
000			 _		
PCBS < 0.1A	0				
hlordone (siphes	<u> </u>	.13 mg/	<u>د</u>		
Uther organice	not defec	ted in	+49 exte	act of the	1.5
Sample					
				Pa	
			1	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
				E 4 9/2	
	·			*** ** C	`
				PACE LA LA LA LA LA LA LA LA LA LA LA LA LA	<i></i>
				W.S.	
					
LPC-8A 4/77	(NOT FOR	DATA PROCES	SSING)	051963	
				CER 051883	



CATE March 23, 1762

1:46 9:10 (A.H.) P.H.

DIRECTIONE N. NNE NE ENE

E ESE SE SSE

MEATHER Sunny, slight wind

from S (~5mph) Temp v50°F

SITE Sunger De / Dad Criste

1004 FS - 8203 - 02

PHOTOGRAPHED BY:

Claude E. Hays II

SAMPLE ID# (if applicable)

N/A

Comerc: Conon AE-1 w/ Canin FD Somm FILL &



Picture #12 ~ Corresponds to number

DESCRIPTION: 1 seking up (northerly) Dead Creak from Judith Lane towards Honsonto and Cerro Corporation

DATE March 23 1962

TIME 9:40 (A.H.) P.M.

DIRECTION: N NNE NE

ESE SE SSE

WEATHER Same as about

SITE Souget II / Doed Creak

1001 F5 - 8203 -02

PHOTOGRAPHED BY:

Claude E Mays III

SAMPLE 10# (if applicable)

Some counters and lens





DESCRIPTION: Eilean Black and April Richards preparing to go

CER 051885

DATE March 23, 1982

11HE 9:50 (H) P.H.

DURI CTIONS (A) MINE ME ENE E ESE SE SSE WILL NO NEC 8

MEALIER Sinny slight wind

from 5 (~ Smph) Temp ~ 58 F

SITE Souget IL / Dowl Crack

TOOL FS - 8203 - 02

PHOTOGRAPHED BY:

Claude E. Kleys, III

SAMPLE 10# (if applicable)

N/A

Comera Conun AE-1 W Comm leas FO Scinm

⊊しいも



Picture 14

DESCRIPTION: On sik work crew beginning air mainitaring in Deed Creak.

DATE March 23 1962

TIME 9 55 (A.M.) P.M.

DIRECTION: N NNE NE ENE © ESE SE SSE S SSW SW MSW W WWW NWW NWW

WEATHER Some as obove

SITE Souget I / Deral Crowle

1004 F5 - 8203 -02

PHOTOCRAPHED SY:

Clauck E. Mays, THE

SHIPLE ID# (if applicable)

used as there



Picture #15

DESCRIPTION: espoit to cochings of breathing height 11- mi (117 lump) 577m 200

CER 051886

DATE Harch 23 1982

TIME 9:56 (A.M.) P.M.

DIPECTION: N MME GEO ENE B FSE SE SSE W MS NEC N

MEATHER Sunny Slight wind

Frm 5 (- 3. NA) KMD ~ 50= F

SITE Souget B/Dod Ouk

1001 F5 - 2223 -02

PHOTOGRAPHED BY:

Claude E. Mays 14

SAMPLE ID# (if applicable)

Camera: Conon RE-1 w Conon FO 50127 FILLS



Picture # 16

DESCRIPTION: Show, lake firmed on Walnut Grave Subdivision property Diad Creek

DATE March 23, 1982

TIME 9 58 (A.M.) P.M.

DIRECTION: N NNE NE ENE ESE SE SE

S SSW SW WSW W WWW WW WWW

WEATHER Sime us above

SITE Sough, Il Devel Creek

1204 FS- 6203-02

PHOTOGRAPHED BY:

Cloude E. Mays II

SWIPLE 10# (if applicable)

Some comerciand lans



Picture # 17

CER 051887

DESCRIPTION: Shows spot \$3 - recidings with H-NU (117 lamp) at braithing region

DATE Harch 13 1982

1146 10100 - 1 P.H.

DIPPOTION: N SME ME ENE E ESE SE SSE

MEATIER Sunny Bight wind

from S (~ smph) Eng ~ 50°F

SITE Souget, I / Day Crock

1001 F5 - 8203 -02

PHOTOGRAPHED 8Y:

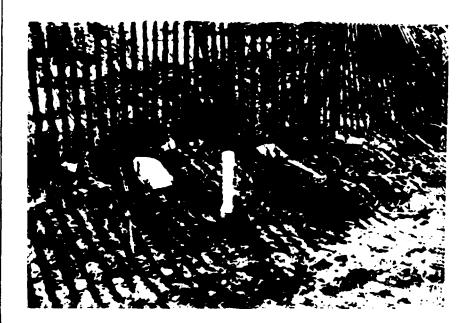
Church E. Mays H

SAMPLE ID# (if applicable)

N/A

Comerce. Convin AE-1 w/ Canon FO Summ Fills

DESCRIPTION: Shows ground water well put in by Ron St. John while working with the Illinois G.P.A. For the Northern Decad Creek Study.



Picture #18

DATE March 23 1982

THE 10: 07 (B) P.M.

OTRECTION: N NNE NE ENE E ESE SE SSE

HEATHER Some as above

SITE Singer I / Decil Create

1201 F5 · E223 - 52

PHOTOGRAPHED BY:

Jack E. Hays III

SAMPLE 10# (if applicable)

Sine Chineic and less as



Picture "19

CER 051888

DESCRIPTION: Spot #4 - reading with H. Nu (11.7 lamp) 4 to 5 pm

5

Ho: G تئ 1962

From S (~5m/h) Tem ~ SUCE TATHER Swing Shight wind

1004 FS - 8203 -02 SITE Sayer 1 / David Crate

Remark PHOTOCHAPHOD BY: E Nous II

SAMPLE (Of (if applicable)

Comerca CHANN FD BURN

DESCRIPTION: Chan 48-1 W 51:1:4

Pichure **†**

Show: Spets 中におる ادستا مع with 14-NU (11.7 lamps) Band Topa

OIRECTION: BIAG 10 O SKIPLE ID# (if spolicable) FIGURAPHED BY: "lande E Hours II March 23 1982 £2 8703-65 وسعا لحسر ومعهدون Sime as above 7/2 DE.. 1 C.2 . K P.H.

PESCALPITON: Shows for since There of the IEPH 19 夏 三万 沙

CER

051889

as above

DATE MAILE 23 1982

TIME 10 15 1 P.M.

MEATHER Swing slight wind

from S (~ singh) Tom ~ 50 F

SIE Frict R Ded Cet 1001 FS - 8203 -02

PHOTOGRAPHED BY:

Ckinde E Mays III

SAMPLE ID# (if applicable)

NIA

Conen FD Scinm Flis



Picture # 22

DESCRIPTION: Shows puly ethylene read container in creek.

DATE March 23 1762

TIME 10.30 (A) P.M.

DIRECTION: N NNE NE ENE E LSE SE SSE S SSW SW WSW

WEATHER Some as above

SITE Singer I / Oud Crake

50- 6058 - CZ 1001

PHOTOGRAPHED BY:

Claude E. Hays TA

SAMPLE LOW (if applicable)

as usual abuse



Picture # 23

OUSCAIPTION: Taking sample of service and placing it into a vivid is to the

CER 051890

SAIE March 23 1982

1146 11:40 A.H. P.H.

DIRECTION: N THE MC ENE E OSE SE SSE S CON ON MSW H THE THE

MEATIER Sunny slight wind

from S (~ Simple) Time ~ 50"F

SITE Single Tr/Ord Creek

1001 F5. 8203-02

PHOTOGRAPHED BY:

Chambe E Hays III

SAMPLE ID# (if applicable)

NIA

Timera Comm AE-1 W Conon FD Somm fills



Picture #1

DESCRIPTION: Show's Devid Creek and surrounding area south of Judith

DATE Harch 23 1982

TIME 11:55 (A.H.) P.M.

DIRECTION: N MME ME UNE

© ESE SE SSE
S SSM GM MSM
N HMM MM NAM

HEATHER Sunny wind from

5-32 @ ~5-100ym, Fee volt

SITE Same A/ Mend Crake

1004 F5 - WWS - OZ

PHOTOGRAPHED BY:

Den weeds

STIPLE ID# (if applicable)

200m - f: 90 mm ~ 230 mm

DESCRIPTION: Shawing area of surpage near land learned to Ruley Transport



Picture # 2

CER 051891

DATE Marin 23 1982

1:HE 11 56 (A.M) P.M.

DERECTION: N NNE NE ENE 120 ESE SE SSE S 204 SH HSW H 1714 (H 1/1/14)

MCATHER Sunny wind from 5-36

@ 5-10, Apin Tang v 60°F

SITE Sunget D/Oad Craik

1001 F5 - 5223 - 02

PHOTOGRAPHED BY:

Den woods

SAMPLE ID# (if applicable)

Comerci Conun AE-1 w/ Zeem for going ~ 235 in

1. 4.5 lane



Picture # 3

OCSCRIPTION: Aren of surpage just south of Carro Corporation and Queny Are Decad Creat

DATE March 23 1962

DIRECTION: N NNE NE ENE

W WAY AN NAM

WEATHER Same us above

SLIE Shuget R / Oard Crank

1004 F3 . 223 -02

FYSTUGRAPHED BY:

Don weeds

SAMPLE 100 (if applicable)

Some comes and less



Picture #4

CER 051892

DESCRIPTION: Closed of drums on Ruon Transport Co projecty Hoping to see . The Some kind on drums

SATE Morch 23, 19EZ

TIME _11'58 _ (H) P.M.

DESE SE SE

MI ALLER SUMPY - Up Ad From Stam

13 10 you Tomp ~ 60°F

SITE Singt TR / Oad Crake

1001 15 - 2203 - 02

PHOTOGRAPHED BY:

Den words

SAMPLE ID# (if applicable)

Comerci Cerum AE-1 w/

1. 4.5 lens



Picture #5

DESCRIPTION: Showing sespence from bunk (piet wit inside channeles of 3 notes)

DATE March 23 1982

TIME 11:56 A.M. P.M.

DIRECTION: N NNE ME ENE
E ESE SE SSE
S SSM CM MSM
W MOM MM NOM

WEATHER Sink as akin

SITE Souget IL / Dend Creek

1:04 <u>F 5 - E20'S 10'Z</u>

TO CHARAPHED BY:

Den Wiedi

SHIPLE 10# (if applicable)

Same orman and time ميط مه دمد ده



CER 051893

DESCRIPTION: Close up of pipe which seems to be the squier of see, one

14 T C5 O 4 C1

March 23 1482

S-10 my Lang visoft

1004 FS - 3223 -02

PHOTOGRAPHED GY:

SAMPLE (D# (if applicable)

DATE

ቯ

=

THE ATTER

Characte Caren AE-1 w Character FO 50 mm fills

wices 10x1 C:2.K

DESCRIPTION: Area of secreta in ner Husers perhan Decard Create new

S. C. Free

DIRECTION: (R) NME SITE Singit II / Oand Creak SAMPLE 104 (if applicable) CHOCORAHHOD WY: Some as approx Wicerds S Pichar # 8 二年代 明祖 から 051894

3

3.100

DIRECTION: N NNE NE ENE E ESE SE SSE S SSW SW WSW WEATHER ____ PHOTO SITE _____

PHOTOLEARHED BY:

SRIPLE 10# (if applicable)

CER 051895

051896

ecology and environment, inc.

Nag. missing for put? ORMAN 4/2/32 (April used it

or getty a copy

for fic #23 to sound to building)

ORMAN 7/21/92 7/21/62 @ Noon Crupton

IL-103-C5- -

DATE MAIL A S. ITE

TIME 11 10 A.H. P.H.

DIRECTION: N NNE NE ENE

E ISE SE SSE S CON ON MEST

MEAT ER During, Wight wild HOW START TIME IN THE

SITE Jumpet of Bushine

1001 FS 2223 24

PHOTOGRAPHED BY:

il conta e May: II

SAMPLE ID# (if applicable)

N/H

Cincin FD Somm Flore



Potence #12 12 - 11 mg Mars

DESCRIPTION: -- King up (nothering) Dead of the book Trichette have to -- with Manuale and Croc Capacina

DATE Haich in 11==

TIME THE A.M. P.M.

DIRECTION: N NNE NE ENE E ESE NE SSE S NOM N ASM

MEATHER _____ CALLS CALLS

SITE Sample it / Direct Chare

1.04 F5 ELLS LL . _

:/دف شا⊼

Marche Li House 15

SA MLE 10# (if applicable)

Line consider and leas





processors to the things to the state of the

CER 051897

E000**855**

- . . . f. . . er

DATE Maich 15 1784 TIME 1 50 A.M. P.H.

DIMOCTION: N NNE NE ENE E FSE SE SSE S SSW SW #5W

m 3 (= 70 m)] my = 2 = SITE -- + E L. V. E

1000 15 2445 -

Chanala - Allega :11 SAMPLE ID# (if applicable) K:/A Jane ... Carrent 146 11 -1 Commercial Control School

PHOTOGRAPHED BY:

4112

CER 051898

WEATHER Sunce is there

DATE Many 25 1166 TIME 1 55 A.H. P.H.

OTRECTION: N NNE NE ENE E ESE SE SSE S SSW SW WSW

SITE Dunce 2 Dral Criet

100**4** <u>F3 - 846 3 - 68</u> _

PROTOGRACHED GY:

Thruste is strongs, the

STIPLE 100 (if applicable)

بالمعاد رك العيوان

Pichus "14 DESCRIPTION: The site work seem be inning so maniform, in shoul stuck

Ministry & bushing neight lines in the

DATE Haran 23 1986

TIME 7 Se (A.H. P.H.

DIRECTION: N MME (NE ENE E CSE SE SSE S SSW SW MSW M 14 M MW

MEATHER THING WIFE COAS

H-10 3 (- 3.49) Tay - 30 F

SITE Court 2 Te at 2 mile

1001 <u>F5 - 1 - 5 - 1 - 5</u>

PHOTOGRAPHED BY:

Minde L. May 12

SAMPLE ID# (if applicable)

Cimera Winer HE I was Canan FO I AM FILL



P. h. - "10

DESCRIPTION: Show, lake browned an evaluation survivosion

DATE March 23 1782

TIME - 58 A.H. P.M.

DIRECTION: N NNE ME ENE É ESE SE SSE S SSW DW WSW

W WANT MW NAME

WEATHER TENNE : ME . .

SITE June 12/ Day 1 Could

1201 15: 8203 02

PROTECTION

Carle C Mays it

STIPLE 100 (if applicable)



CER 051899

DESCRIPTION: The grant spect to the control of the

DATE March 23 1782

TIME 13 15 A.M. P.M.

DIRECTION: N NNE NE ENE

E ESE SE SSE S SSW SW WSW W NW W NWW

WEATHER June 4 The wind

from Day myor Ting with F

SITE Singer IL / To of Crick

1001 FS 8445 CE

PHOTOGRAPHED BY:

Chance Alers TH

SAMPLE (Of (if applicable)

NA

Elmeic Converte 1 w/ amen FO Somm File

DESCRIPTION: Show, yound wither well put in by Rom St. John while mirking with the Fleinous & P of the the Manny Decial Co.

Pichery #13

DATE Main 23 1982

TIME 10 04 A.B. P.M.

OTRECTION: N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW

WEATHER Some is its it

SITE Singer I/ Dec. 1 Crake

1004 F5 - E323 - 04

PERCENTAGE AT:

Jerik & Hay: II

SAMPLE 10# (if applicable)



1 chair 12

CER 051900

DESCRIPTION: First #4 - 1- duy ... m 11 No. (117 12mg) 4 to 5 Am

ruge ____

DATE Main 23 1982

TIME 15 03 A.H. P.M.

DIRECTION: N NNE NE ENE

E ESE SE SSE S SSW SW WSW

MEATHER During hight wind

1-12 - my (-5. mp. -) Cm - X-r

SITE range I, be I were

1001 F3 - 8233 C2

PHOTOGRAPHED BY:

limite to Mays TI

SAMPLE ID# (if applicable)

NA

Line is when he is w CLAND FOREMA FILLE

ticker

DESCRIPTION: Spen 458 458 42 - Medings with 11 Now (11 1 Mary) 3 and Type

DATE March 23 1782

TIME 10 10 A.M. P.M.

DIRECTION: N NE NE ENE

E ESE SE SSE S SSW OW WSW

WEATHER Swall Tes . Boile

SITE Travet R / Beat Creak

1000 F.5 E & 3 C4

COLUMNATHED SY:

January: 18

SAURIE 100 (if applicable)



CER 051901

DESCRIPTION: "They made from (plant that on the I'll + 14) on the comment

DATE Maich 23 1982

TIME 10 15 (.H. P.M.

DIRECTION: N NNE NE ENE

S SSW SW WSW

HEATHER Sungy Stight Link

tion Single Tray of the F

SITE Durch I Beather

1001 F3 82-5 CZ

PHOTOGRAPHED 8Y:

ikunde E Nkoy, itt

SAMPLE ID# (if applicable)

Carrell Conon HE I WIM Comer FD Scines FI 18

DESCRIPTION: Thomas puly ethylene will contriner in court

DATE March 23 MEZ

TIME 10 30 QUE P.M.

DIRECTION: N NNE NE EME E ESE SE SSE S SSW SW WSW W WWW NW NNW

WEATHER Suine to their

SITE Sence I / Oucl Cake

1004 5 5 6205 -CZ

PHOTOGRAPHED BY:

Clarete E Hoys M

SAMPLE ED# (if applicable)



DESCRIPTION: The in it is made of single with flowing it into a single

CER 051902

DATE March 23 1982

THE 11 40 A.H. P.H.

DIRECTION: N NNE NE ENE

E ESE SE SSE

WEATHER Sunny slight wind

from 3 (~ 5.mph) kmy ~ 70 F

SITE Seat 12/00-10. K

1000 F5- ELLS CZ

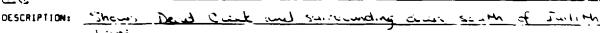
PHOTOGRAPHED BY:

Chambe L May: I

SAMPLE ID# (if applicable)

~/~

Comerce Comm HE I by Junua PD SOMM for 16



Finhere #1

DATE March 23 1982

TIME 11:55 (A.M. P.M.

DIRECTION: N NNE NE LINE E ESE SE SSE S SSW SW HSW W WAW MW NNW NNW

WEATHER Sway would from

5- su 3 - 5 lungth Tay - al F

SITE mint A/ but Conte

1004 <u>F5 - Lws - 02</u>

PHOTOGRAPHED 3Y:

Der wichts

SAMPLE (Of (if applicable)

20 m - for 10 mm - 12 mm



CER 051903

DESCRIPTION: Thermany same of acquire mayor parade persons to the

SEPI ES MIDM STAD

TIME 11 SU A.H. P.H.

DIRECTION: N NNE NE ENE

E ESE SE SSE S SSW SW WSW W YORK W NAW

MEATHER Sunny wind Fix 5 1-

1) 5 14. April Time + ce +

SITE 12/06-12-2

1001 F3 : - 3 - 6

PHOTOGRAPHED BY:

Den carries

SAMPLE ID# (if applicable)

Been f. Town - 22 am



Picture # 3

DESCRIPTION: How of super just wenth at Chris Consumber and Charing Ave ,

SAIN E'S NEVELY STAD

THE 11 51 4.4. P.M.

DIRECTION: N NNE NE ENE

WEATHER Sime is where

SITE Souget IR / Oad Crack

1001 F5 243 -42

FOURMERATHED BY:

Dry wech

SAMPLE 10# (if applicable)

CER 051904

DESCRIPTION: They it is being a require to a graph of property they are not been was kind on drains

DATE March 23 1982

TIPE 11:58 (.H. P.M.

DIRECTION: N NNE NE ENE

Ë`ESE SE SSE

S SSM SM MSN

M SOM ON SM

MEATHER Sunny wand from State

(3) 10 you . They wee'r

SITE June 12 / Deal Could

1000 F5 8203-02

PHOTOGRAPHED BY:

1/2 CU : 35

SAMPLE ID# (if applicable)

N/A

Clines Cerun Herry 25.4

1: 4.5 lens

DESCRIPTION: Showing supering from bank (1122 -1 Inside channeles of 3 news)



Pichuce #5

DATE Mails 25 1984

TIME 11 5 A.M. P.M.

DIRECTION: N NNE NE ENE
E ESE SE SSE
S SSN SN HSM
N HNN NN NNN

HEATHER SAME IS CHECK

SITE SAME IN COLOR

PHOTOGRAPHED WY:

SAMPLE HOW (if applicable)

Street Comment with



Picker Hr

CER 051905

OUSCAIPTION: Chera my of paper which some to be the the remaining of the

DATE Marin 23 1982

THE 11 32 (H. P.M.

DIRECTION: N NNE NE ENE

E- ESE SE SSE

S SSW SW WSW

M TON ON SMITH

MEATHER Sunny Count from 5-2

@ STIGHT THEY I GOTT

SITE Dinget 2/ Deal Crack

1000 F5 263 62

PHOTOGRAPHED BY:

irm words

SAMPLE ID# (if applicable)

~/4

Charles FO 50 mm files



Picture #7

DESCRIPTION: Are, of surprise in northern portion of Dead Greak new level Corp

DATE March 23 1982

TIME 11 51 (H. P.M.

DIRECTION: N. NE NE ENE

E ESE SE SSE

s ssw on wsw

HEATHER Suna as above

SITE Smy IL/Out Get

1000 F5 E23 - 62

PHOTOGRAPHED BY:

Ten werds

SAMPLE ID# (if applicable)

<u>N/A</u>

Some comercia consideras.

Picture * &

DESCRIPTION: James and old substants



CER 051906

E000864

FIELD PHOTOGRAPHY LOG SHLET	Con-	ge <u>11</u>
DATE HOWEN ZTS ISER TIME IZ COMEN A.M. F.M. DIRECTION: N NNE NE ENE E ESE SE SSE S SSN SN HSN N COR W ANN		
MEATHER Sunsy will film 3-300 SITE Sunsy R. De al Creek TOOD FS - 5203 02 PHOTOGRAPHED BY: Ton cureds SAMPLE IDD (if applicable) N/14		
Camer. Com AE-1 we Canon PO SUMM for it	Pichuc # 9 With drums and only substance on Carre Ciro in	
DATE A.H. P.M.		
DIRECTION: N NNE NE ENE E ESE SE SSE S SSW SW MSW		
WEATHER	PHOTO	
PHOTOGRAPHED BY:		
SRIPLE (O# (if applicable)		
DESCRIPTION:	CER 0519	907